Volume XV
Number 5

NOVEMBER, 1898.

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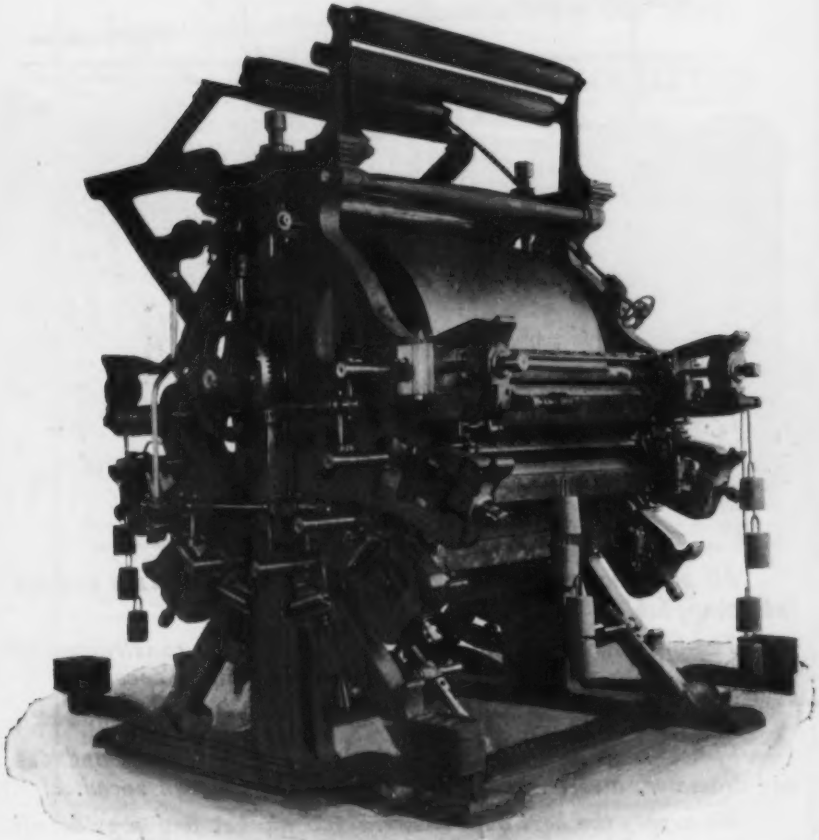

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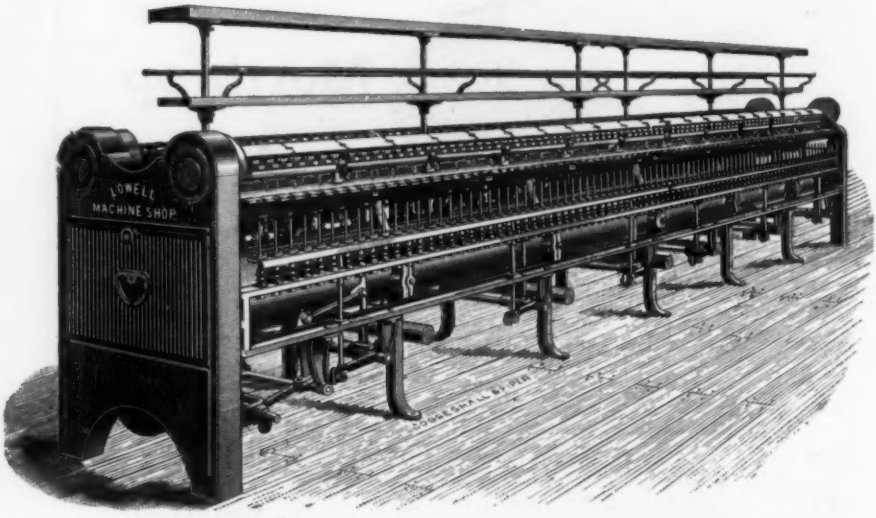

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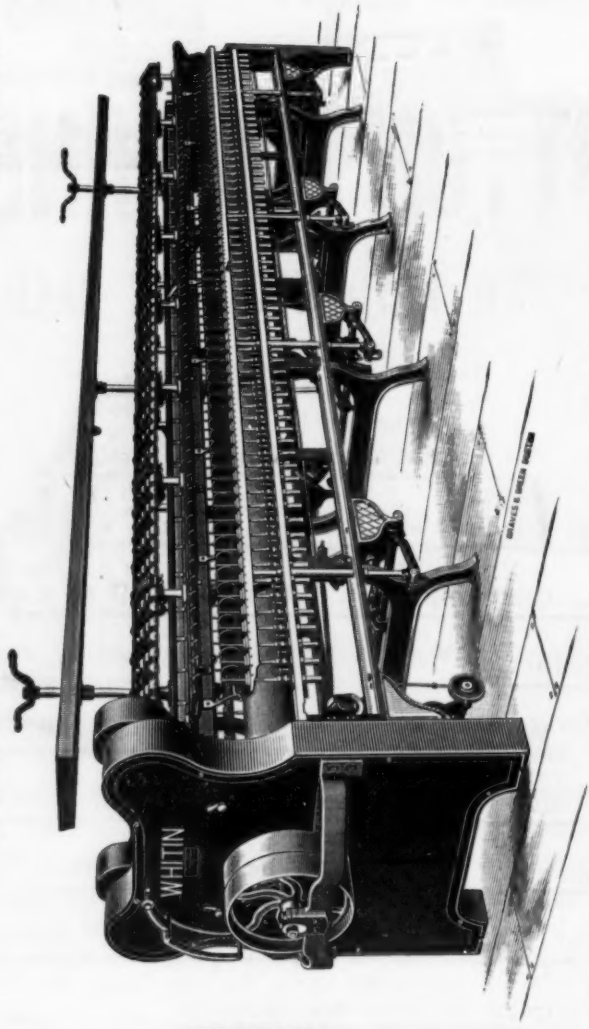

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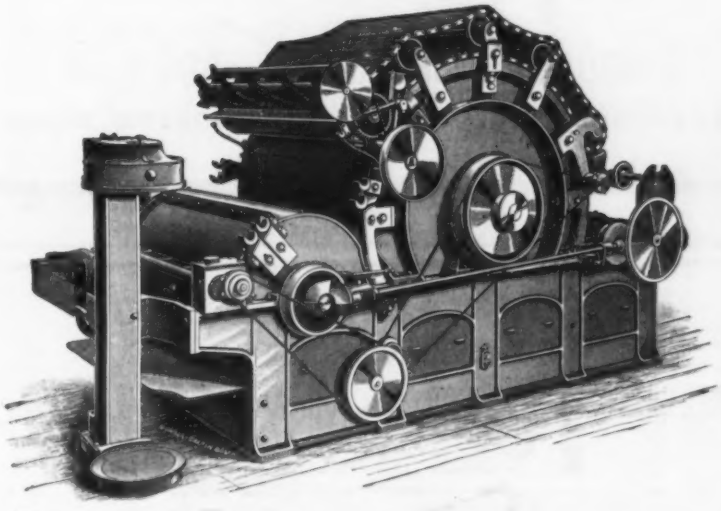

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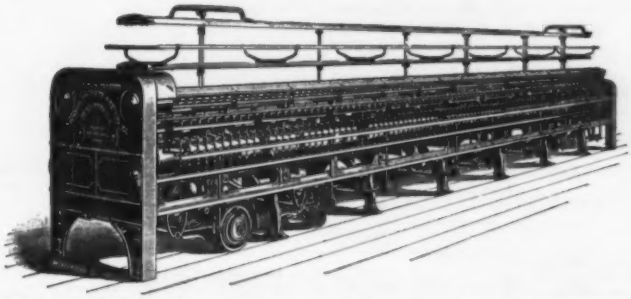

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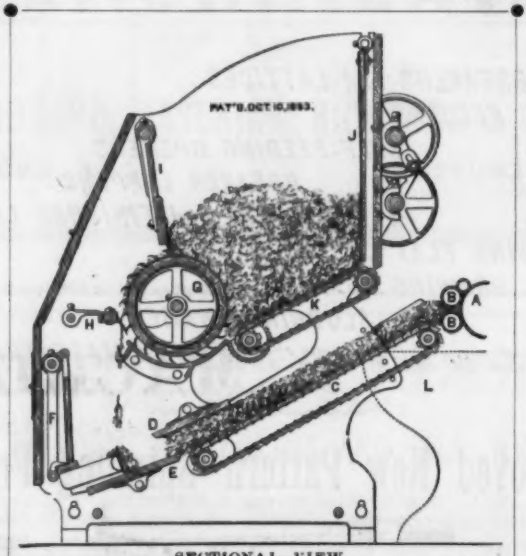

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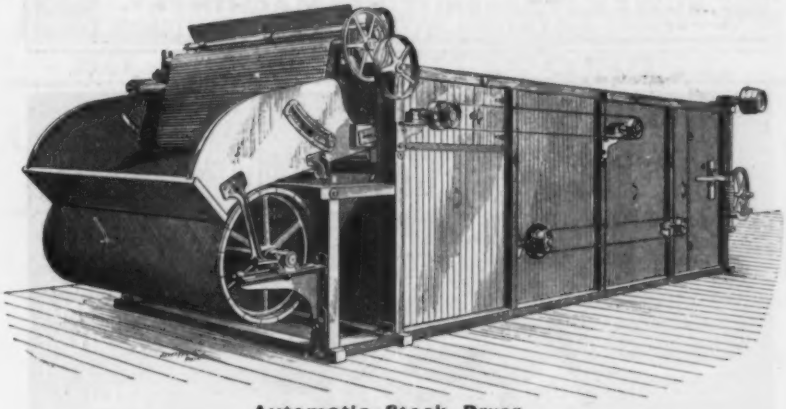

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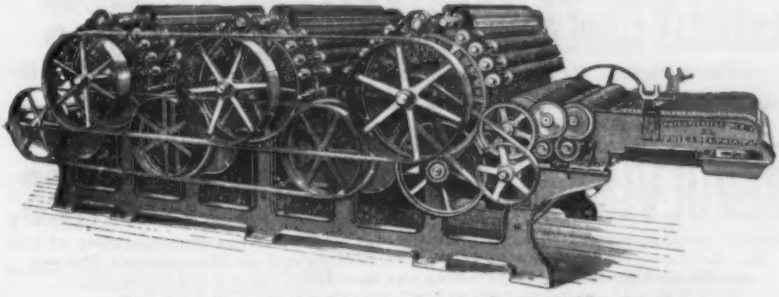

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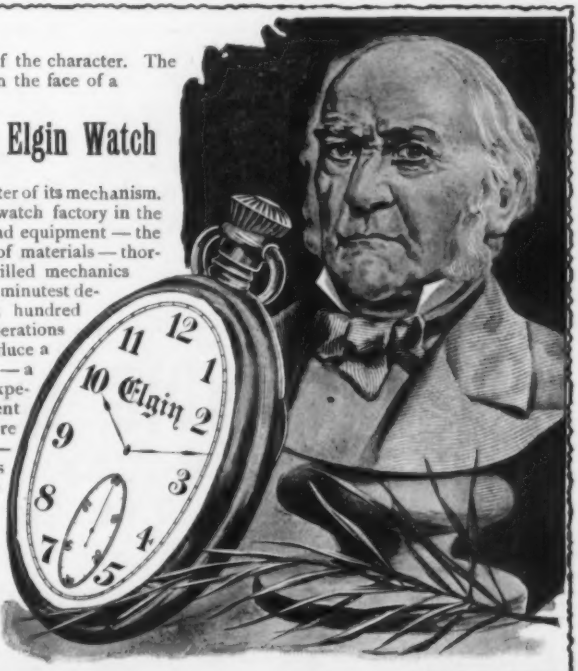

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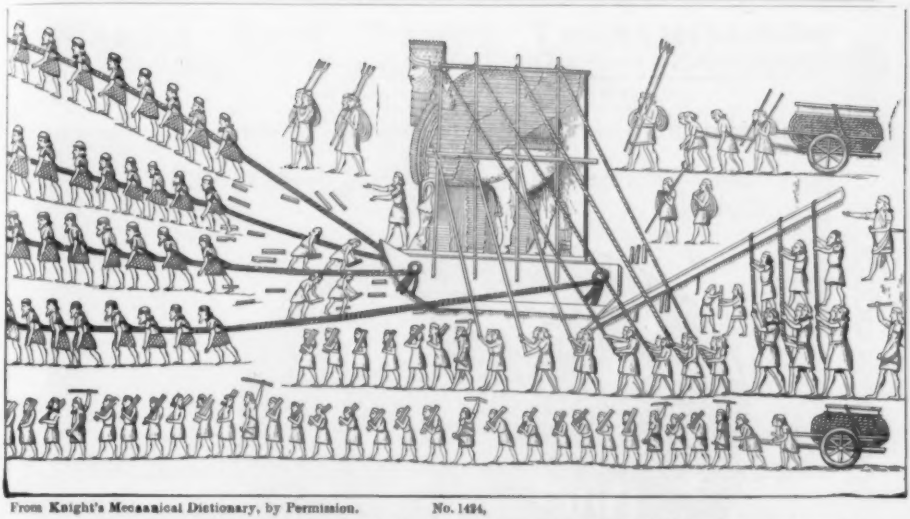

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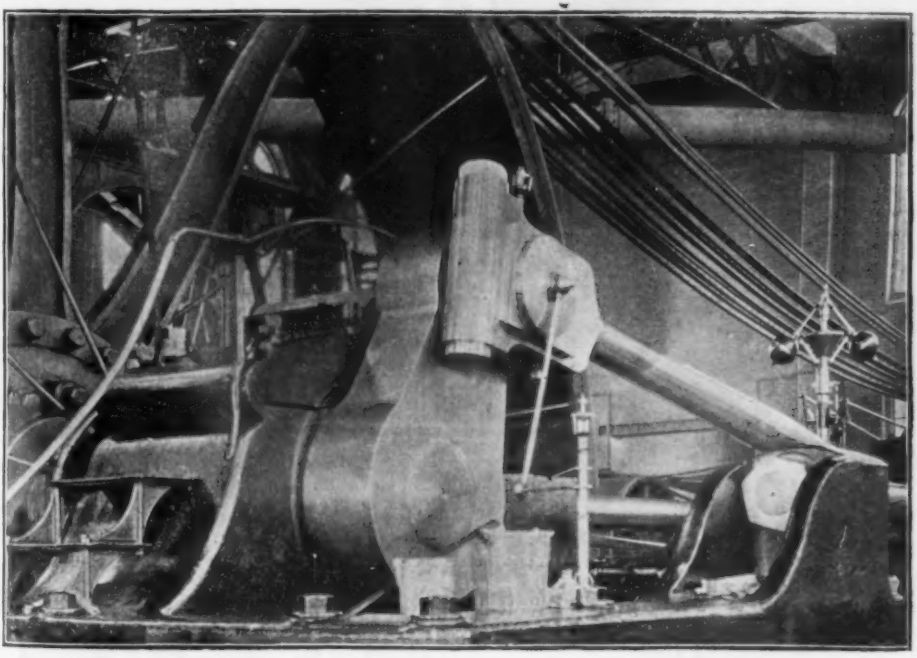
Assyrians moving a human-headed bull. Copied from a bas-relief at Koyunjik. This sculpture is of the age of Osirtasen II, the contemporary of Joseph, between 1652 and 1636 B. C.



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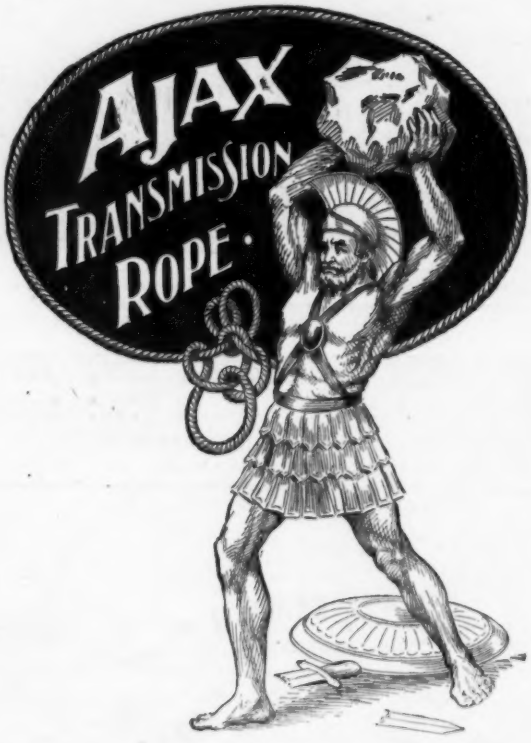

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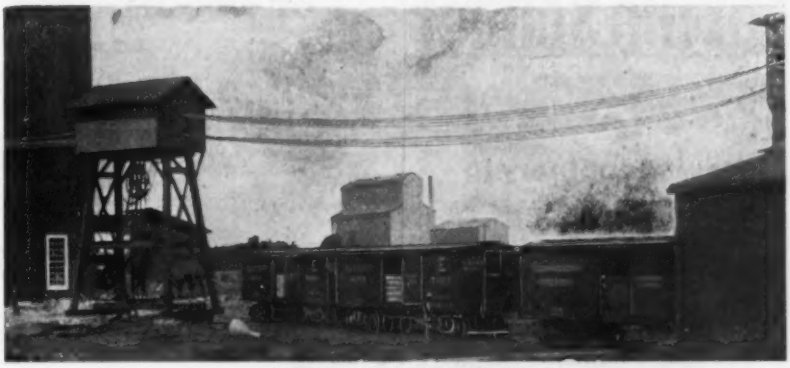

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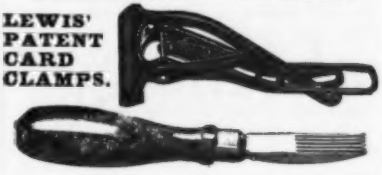

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List of Textile Patents.

Issued September 20, 27, and October 4, 11, and 18.

Beater Machine for Opening Textile Materials. 612,548 T. R. Marsden, Oldham, England.

Cotton from Gins, Apparatus for Conveying Lint. 611,360. J. R. Fordyce, St. Louis, Mo., assignor to the Thomas Manufacturing Co., Little Rock, Ark.

Carding Engine. 612,303. E. V. Bates, Lowell, Mass.

Combing Machine. 612,334. A. Gunerman, Hoboken, and G. Schacht, Jersey City, N. J.

Cloth Sponging and Shrinking Machine. 611,795. G. Rothholz, Rochester, N. Y.

Cloth Cutting Machine. 611,861. N. Komow, New York City.

Cloth Folding Machines, Feeding Mechanism for. 611,789. G. A. Schulze, Halle, Germany.

Carding Machine Feeding Machine. 612,566. T. R. Marsden, Oldham, England.

Dyeing Apparatus. 611,428. E. Decock, Roubaix, France.

Holland and Colonies.

Patents. Trade Marks.

H. Massink, L. D. at Amsterdam.

Dyeing Apparatus, Hank. 612,343. C. A. Hunt, Jr., Lexington, N. C.

Dyeing Textile Fibres, Yarns and Fabrics. 612,274. John T. Reid and H. Thorp, Pendleton, England.

Embroidering Machine Jacquard Mechanism. 611,011. H. Hill, Nottingham, England.

Embroidering Machine. 611,097. G. Baum, Rorschach, Switz.

Hat-forming Machine. 612,425. R. J. Lynch, Danbury, Conn.

Knitting Machine. 611,130. I. W. Lamb, Perry, Mich.

Knitting Machine Attachment. 611,951. James Taylor and J. F. Flad, Philadelphia, Pa.

Knitting Machine Attachment. 611,648. J. Palmer, Philadelphia, Pa., assignor of one-half to E. H Godshalk, same place.

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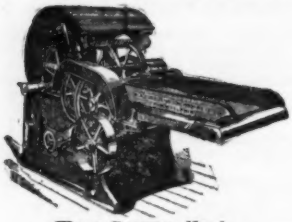

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Knitting Machine. 611,862. I. W. Lamb, Perry, Mich.

Keir, Circulating. 612,210. J. F. Monaghan, Lowell, Mass.

Knitting Machine, Circular. 611,751. L. Gearhart, Lawrence Pa., assignor to Daniel F. Wisotzkey, Clearfield, Wm. C. Davis, Houtzdale, and Chas. L. Zimmermann and W. L. Sheets, McKeesport, Pa.

Loom for Weaving Coir-yarn, Mats or Other Fabrics. 612,519. E. Hodder, London, Eng., assignor to Wm. Goodacre & Sons, Ltd., same place.

Loom Harness-Motion. 612,645. J. Hilton, Philadelphia, Pa.

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STEPHEN A. KNIGHT.

TEXTILE WORLD.

Vol. XV. NOVEMBER, 1898. No. 5.

STEPHEN ALBERT KNIGHT.

Among the many cotton manufacturers of New England, none have risen to greater prominence than the firm of B. B. and R. Knight consisting of the three brothers, Benjamin B. (now deceased) Robert and Stephen A. These men beginning without any resources whatever, their only capital being good health, and a worthy ambition to make their mark in the manufacturing world, have by untiring energy, and tenacity of purpose attained a measure of success accorded to but very few persons.

It is, however, with the younger of these brothers, Stephen A., whose portrait is found on the opposite page, that this sketch has to do. At an extremely early age he began work in the cotton mill owned by Elisha Harris (afterward Governor of Rhode Island) at Coventry, R. I., to which place his family removed in 1835. He remained here until his eighteenth year, when he found employment in the cotton mill owned by Dr. Harris at River Point, R. I. Here he remained until the fall of 1847, when he went to East Greenwich, R. I., to take charge of the mule department in the steam mill operated by Benjamin Cozzens. He worked here until Mr. Cozzens failed in business, and the mill was closed when he entered the employ of Bowen & Battey, grocers, in Providence, R. I. This kind of mercantile life not proving congenial to his tastes and inclinations, he remained here only about a year. In 1849 he entered the factory of Parker & Knight (of which firm his brother Robert was a member) at Arnold's Bridge, now Pontiac, R. I., and was overseer of spinning until the fall of 1850 when work in the factory was suspended for about eight months in order to remodel the mill. Mr. Knight had now fully made up his mind to devote his time and energies to the cotton manufacturing industry. To better equip himself for this work, having been employed from childhood up to this time with but meagre educational advantages, he entered Fruit-Hill Academy under the tuition of Stanton Belden, devoting himself to those studies that were best adapted to fit him for the occupation which he had chosen. This tuition, which proved of great benefit to him, was paid for out of the earnings of previous years.

In the summer of 1851, he resumed his duties in the mill, and remained there until Feb. 1853, when he removed to Hebronville, Mass., and, with his brothers Benjamin B, and Robert, purchased the mill property there of Harkness & Stead. The mill being entirely new without any machinery, Mr. Knight began to supply the necessary machinery, and to build tenement houses. While thus engaged, the mill on the evening of July 10, 1853, was struck by lightning and entirely consumed. A brick mill with a capacity of 5,000 spindles was immediately begun, Mr. Knight furnishing the designs, and personally superintending the construction, and on Jan. 10, 1854, just six months from the time of the destruction of the old mill, the carding department of the new plant was started, Mr. Knight assuming the duties of superintendent. Since then the capacity of the mill has been increased to about 25,000 spindles, and some 56 tenements have been added to the village, making a total number of about 80 tenements.

In 1866 Mr. Knight removed to Providence, and became the agent of the Hebron Manufacturing Co., which in

that year purchased the Dodgeville Mill property. He superintended the reconstruction of the Dodgeville Mill and increased the capacity from 7,000 to about 26,000 spindles. He also built about 50 new tenements, and reconstructed the remaining 40 tenements in the village.

In 1868 he bought one fourth of the Grant Mill in Providence, and on the death of Zachariah Parker, in 1870, the Hebron Manufacturing Co. bought the whole mill property there. Since then under Mr. Knight's supervision the mill has been remodeled and enlarged, a new building erected, and the capacity increased to about 10,000 spindles. The Dodgeville Mill and Grant Mill manufacture, in all its various widths, the celebrated cloth known as the "Fruit of the Loom." The Hebron Mill was, until a recent date, run on the same class of goods, but is now being rearranged and put into a first class yarn mill.

With the exception of the few months spent at Fruit-Hill Academy and the relinquishment of his duties during the greater part of 1879, on account of impaired health, Mr. Knight has been closely confined to business since he began work in a cotton mill in his early youth.

While Mr. Knight has been thus actively engaged in developing his mill property, he has not been idle in looking after those things which contribute to the comfort and welfare of the operatives. This is witnessed to by the Methodist Episcopal Church at Hebronville; Mr. Knight not only giving largely to the cost of building, but paying personal attention to the construction, even to the minor details. Since then he has contributed liberally to the support of the ministry here, as well as keeping the church edifice in repair. The founding of a Public Library at Hebronville was an enterprise in which he took great interest, besides furnishing substantial aid. To his fostering care, generosity and judgment, in a large measure, the erection of the handsome and commodious school building in this village is due. He also purchased a tract of land sufficient for church and burial purposes, between Hebronville and Dodgeville, and gave it to the Catholic society that had been organized by the operatives of the two villages, as well as making many improvements later on when a handsome church edifice had been erected. To the cost of this building he did not fail to contribute, and when it was dedicated it was called St. Stephen's Church to show the society's appreciation of its benefactor.

These are only a few instances out of the many that might be named, showing Mr. Knight's interest in the welfare of the people in the different villages where his mills are located. Enough has been said however to illustrate his disposition to encourage and aid those who were seeking to improve their condition and surroundings.

During all these years, and some of them have been very trying ones, strikes and controversies have been almost entirely unknown in the mills under his charge, owing, undoubtedly, to the fact that, having spent so much of his life in the mill as an operative, he thoroughly understands what is due to employer and to employee, and this knowledge enables him to ask of his employees only that which is right and practicable.

Politically he is a stanch Republican, and while taking no active part in politics, he has been a constant and close reader and observer of legislative proceedings and political matters in general. Though often pressed to accept important positions in the gift of his party, he has steadily declined, believing that his time and energies should be devoted to his large cotton manufacturing interests.

For a number of years past he has been a member of the New England Cotton Manufacturers' Association, taking great interest in all its proceedings, and special interest in the subject of handling and baling cotton. Mr. Knight served three years on the board of directors of this asso-

(Continued on page 117.)

Textile World

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Special quarterly issues are published in January, April, July and October; one (January) being a statistical issue, and the others devoted especially to the cotton, knitting and woolen branches, respectively.

SILK MANUFACTURE IN THE UNITED STATES.

There is going the rounds of the press an announcement that the exports of domestic silk manufactures are rapidly increasing, and that the total exports for the current year, thus far, have been fifty per cent. more in value than for the same time last year. The impression that is intended to be conveyed by this is that American silk manufactures, in certain lines, at least, can be exported to compete with the foreign product. Lengthy articles, in some instances, have been written upon this favorable status of the industry in this country. The facts of this condition are said to lie in the recent statistics issued by the Treasury Bureau of Statistics, Washington, D. C. The percentage of increase alone is given, the actual figures being withheld. Turning to these statistics, we find that for the eight months ending with August, 1898, the value of the exports of domestic silk manufactures was $225,551, against $148,805 for the corresponding period the year before. We see in this, that there has been an actual increase of about fifty per cent. Should this value of exports continue for the full twelve months at the same ratio as for the first eight months of the current calendar year, it would amount to $340,000, or less than one-third of one per cent. of the total value of the manufactures of the United States; a very small proportion of the domestic product.

It can hardly be contended that the cost of the manufacture of silk fabrics in this country can be reduced, under present conditions, to a level that will enable them to enter foreign markets in competition with the manufactures of the world. Nor is it of any urgent necessity for the silk manufacturers of this country to seek foreign markets. The home market is by far a better one, and it furnishes a demand of a character sufficient for any ordinary production of our factories. If there is any danger of over-

production, it will be due largely to prices restrictive of consumption. Should over-production take place, economy in manufacture will have to be imposed by new mechanical devices, or by the consolidation of capital into larger plants, and the minimizing of expenses.

Items have appeared relating to certain exports of silk manufactures to Lyons, but these were not upon any commercial scale of importance, and were made purely for the purpose of showing the excellence of certain classes of silk production in the United States, without any expectation of realizing a profit. These exports consisted of lining silks which are successfully made in this country, and valued for their special excellence for garments, because of their durable qualities and purity of colors. This line of fabrics, as well as satin duchesse, satin du chien, merveilleux, serges, etc., control the American market, and have no foreign competition.

It is difficult to present a statistical exposition of the silk industry in this country, that will show its present status compared with that existing during the census year of 1890. The most satisfactory means for measuring its growth, at our disposal, are the imports of raw silk, which furnish the only raw material for our silk manufactures. The imports of raw silk, as reeled from the cocoon, amounted to 5,943,360 pounds in 1889-90, and 10,315,161 pounds in 1897-98, showing an increase in the consumption of this material between 1890 and 1898, of 74 per cent., which may be roughly taken as indicating the growth of our silk manufacturing industry, in the amount of goods that are made. This, however, should not be taken as representing the increase in the value of the manufactured production, as values are less now than they were in 1890. It should be remembered that the price of raw silk in the latter year was unusually high ($3.92 per pound), higher than any time for several years previous, or since. The value of imports in 1897-98 was $3.05 per pound. We are inclined to estimate the value of the silk manufactures of the United States, at the present time, not far from $125,000,000. This represents the gross value of manufactures, the net value being nearer $105,000,000; rather less than over. Of course, the basis of our estimate are the census figures of 1890, which show a gross value of $87,298,454, and a net value of $69,154,509, it being reckoned that the difference between these two values was included twice in the calculations. Raw material and labor are no higher, but rather less now than then, as well as other expenses that enter into the cost of production.

The following table shows the imports of raw silk and value of manufactured silks in the last thirty years, by five-year periods:

Year.	Imports of raw silk Pounds.	Imports of silk manufacture
1868	512,449	$17,777,627
1873	1,159,420	29,890,035
1878	1,182,750	19,837,972
1883	3,253,370	36,764,726
1888	5,173,840	33,350,999
1893	7,422,430	38,958,928
1898	10,315,161	23,523,110

The value of imports of silk manufactures was forty per cent. less in 1897-98 than in 1889-90. The falling off was mostly in the miscellaneous goods, such as combination fabrics of silk with worsted or cotton. The comparative value was about the same in piece goods, laces, braids and bindings, more in ribbons, but considerably less in plushes and velvets. The imports in the latter two classes of manufacture were relatively large in 1890.

IMPORTS OF SILK MANUFACTURES.

	1889-90	1897-98
Clothing and wearing apparel	$ 595,344	$ 1,855,.79
Dress and piece goods	10,975,087	10,495,057
Laces and embroideries	3,804,374	3,349,464
Ribbons	1,968,486	2,035,411
All other	21,343,083	5,787,899
	$38,686,374	$23,523,110

The volume of importations is not always a safe criterion for showing the prosperity of domestic manufactures. There are several leading causes that might have an influence upon lessening importations, such as an impoverished condition of the people, affecting their ability to purchase, as well as restrictive customs tariff rates. Diminished imports may mean depression in the industry, as reflecting the financial circumstances of the people; therefore it is not always well to argue upon the condition of an industry from the amount of imports of competing merchandise.

According to the census of 1890, there were in this country 472 establishments engaged in the manufacture of silk. Today, the number is about 553, according to the best count that we are able to make. We give a table showing the number of establishments in each state. It will be seen that very material increase has taken place within the last eight years, in the states of New Jersey and Pennsylvania, while the other states have remained practically at a standstill; New York, on the contrary, with less in number. Pennsylvania has been adding to its silk industry very rapidly of late years, more so than any other state, though New Jersey has increased its output very considerably. Increase in the number of establishments, however, is not always a reliable guide for measuring the growth of an industry, as larger mills are being erected, to a greater exclusion of smaller ones.

The following table presents the number of silk manufacturing establishments in the United States and value of their products, shown by each census since 1860. The statistics for 1898 are those of the Textile World's Directory.

Year	No. of establishments.	Value of products.
1860	139	$ 6,607,771
1870	86	12,210,662
1880	382	41,033,045
1890	472	87,298,454
1898	553	

SILK MILLS IN THE UNITED STATES.

	1890	1898
California	9	7
Connecticut	35	39
Illinois	10	9
Maryland	4	2
Kansas		1
Maine	1	1
Massachusetts	20	22
Michigan	1	2
Missouri	1	
New Hampshire		1
New Jersey	132	179
New York	185	148
North Carolina	1	1
Ohio	3	4
Pennsylvania	66	125
Rhode Island	3	9
Utah		1
Virginia	1	2
	472	553

Most of the silk manufactures in the United States are concentrated in the five states of New Jersey, Pennsylvania, New York, Connecticut and Massachusetts.

The silk manufactures of the Pacific coast are limited to the production of fringes, cords and yarns for embroidery, knitting and other purposes.

The silk establishment that we credit to Kansas is the State silk plant at Peabody. The seven in California, and this one in Kansas, are the only silk manufacturing plants west of the Mississippi River. The nine in Illinois are all in Chicago, engaged in making trimmings, laces, braids, etc., with which we have included two factories that make combination goods with cotton, worsted and mohair.

The two mills in Michigan are of large capitalization, one being engaged solely in the manufacture of silk, as serges, satins, hosiery, etc., while the other is employed in combination goods of silk, worsted and mohair for braids.

The four factories in Ohio are situated in Cincinnati and Cleveland, engaged in the manufacture of trimmings, fringes, etc. Of the 148 establishments in New York State, 94 are located in New York City. There are no particularly large silk plants in this State, except three which are outside of New York City, in which an aggregate capital is employed

of $1,100,000. The multitude of silk goods made in this state is too numerous for us to mention *in extenso*, but yarns, threads, plushes, novelties, dress goods, labels, fringes, trimmings, braids, etc., are made. We include in our list, the throwsters.

Of the 179 establishments in New Jersey, 128 are located in Paterson. Some of these are highly capitalized, two with a capital of over one million dollars each. The manufactures of this state are rich in design, quality and style. All kinds of novelties and small wares are made here, besides dress goods, broad silks, millinery goods, underwear, yarns, threads, handkerchiefs, ribbons, tie silks, tapestries, brocades, chenilles, satins, etc.

There are several large manufacturing establishments in Connecticut, employed in the production of the highest grade of silk fabrics, as dress goods, velvets, plushes, satins, fringes, etc.

We have included in the silk mills of Massachusetts, several that are engaged in combination manufactures of silk, cotton and worsted. There are two in this state, each with a capital of one million dollars, and several with capitals of $25,000 to over $600,000. A large production of yarns and threads are made in this state, besides novelties in the way of fabrics, tassels, fringes, fish lines, braids, etc.

The silk mills in Pennsylvania are not among the largest in this country. There is one with a capital of over $800,000, and several of $100,000 to $200,000. The manufactures of this State are confined principally to threads, yarns, dress goods and small wares, including novelties, braids, trimmings, etc. Some plushes and seals are made in this state, besides chenille goods.

There is one mill in the state of Maine, making dress silks; two in Maryland, making fringes, yarns and novelties; one in New Hampshire, making yarns; and two throwing establishments in Virginia.

The one establishment in Utah which we have accounted for, is a small one, in which four hand looms are used, and therefore cannot be strictly regarded as a factory.

WAGES.

Some very interesting statistics have been recently presented by the national department of labor, relating to the wages in this country and in Europe. Upon an examination of the statistics which have been carefully gathered, relating to occupations which are susceptible of accurate definition, we find that there has been a gradual advance in the wages of workmen in the United States, Great Britain and France. The advance since 1870, has been 14.6 per cent., in Great Britain; 25.5, in France; and 10.3 per cent. in the United States. This covers the wages of such occupations as blacksmiths, brick layers, carpenters, engineers, iron molders, common laborers, machinists, and others engaged in like pursuits. In 1892, the wages in the United States were 16.1 per cent. higher than in 1870, but since that year there has been a steady decline to 10.3 per cent. The United States is the only country under consideration that has been affected this way. The advance in Great Britain has been very marked since 1890. The wages of textile employees have not been considered, but these percentages have a general application affecting all industries. It may be noted that the data upon which the department of labor relies, are from firms that have done business continuously since 1870. To show that these percentages reflect the condition of the textile industries, we have but to refer to the late report of the Massachusetts Bureau of Labor Statistics. According to the national department of labor, there was an increase in the average wages, in ordinary occupations between 1881 and 1898, from 9.2 above those existing in 1870, to 10.3

above those of the same year, or 1.1 per cent. We note, according to the Massachusetts statistics, that the wages in cotton mills were 1.58 per cent. higher in 1897 than in 1881, and in woolen mills, 4.93 per cent. higher.

In considering any decline or advance in nominal wages, one should take into calculation, for ascertaining real wages, the prices of commodities and the purchasing power of money, to which we have referred in a previous issue.

REFUNDING DUTIES ON BURLAPS.

There is an urgent pressure upon the Treasury Department, on the part of cotton manufacturers engaged in the export trade, to have a ruling which will permit the refunding of duties, or an allowance, as a drawback on imported burlaps used for the covering of bales of domestic cotton goods that are exported. This movement is promoted chiefly by Southern manufacturers engaged in the export trade. The argument that is presented to the Department seems to be an equitable one, quite within the purpose of the law, based on the fact that burlap, as an outside covering for manufactured goods, forms an essential and important part of the bale. It is well known that the law allows on all articles made wholly from imported materials, and on many articles made partly from such materials, upon exportation, a drawback to the full value of the duties paid on such materials, less one per cent. The law even goes further than this, by providing that if any imported materials are used in the manufacture of an article made in part from domestic materials, and in part of imported materials, so that the latter can be readily measured or their value ascertained, the latter is entitled to a drawback of the duties paid thereon, less one per cent.

Manufacturers that export domestic cotton goods, and use imported burlap, receive the latter from the importer in bales in the same condition in which they are imported, never using the old, or second-hand, burlap. This being the case, we can see no particular difficulty in the way of adjusting the refunding of duties.

BUSINESS PROSPERITY.

It may seem to those engaged in the textile industry, especially cotton and wool, as a stretch of the imagination to say that the business in this country is now in a most active and prosperous condition, but such is really the fact. Unfortunately, the textile trades are the exception to this rule, for causes that are not clearly understood, and probably will not be satisfactorily explained for one or two years to come, when a retrospective view can be more intelligently taken. As a fact, however, the volume of business that is being transacted in this country was never so large as at the present time, nor the aggregate profits greater, nor the number of failures less among those who confine themselves to their legitimate occupation. The failures that have taken place of late, aggregating with unusually large liabilities, have been due to causes that have no direct connection with the conduct of the business that met with disaster. An instance of this may be noted in the recent failure of a large woolen concern at Dover, N. H.

The amount of business transacted through the clearing houses of the country is over eight per cent. larger than last year, and 1½ per cent. larger than in 1892, which was a peculiarly prosperous year. Even a better showing than this would probably be made, were it not for the political elections that have taken up more or less of the attention of business men.

The railroad earnings for the past month have been six per cent. larger than last year, and six per cent. larger than in 1892, notwithstanding that freight rates are much lower. The movement of freight from the manu

facturing sections is larger than it was last year.

Our export trade was never in a better condition, being in excess over last year for the first nine months, of nearly seventeen per cent. in value, while the value of our imports for this time was about twenty per cent. less. The increase in our exports has been in agricultural and manufactured products. The United States today stands in the position of a large creditor, with the prospects of remaining so for a long time to come.

The position of cotton manufactures is much better than it was a year ago, experiencing a great relief in the export demand of goods that are suitable for foreign consumption. It is unfortunate that we are unable to obtain statistics relating to these exports by the way of the Canadian railways, as they are not reported to the Treasury Department. Still, our export of these goods is but a fraction of the amount that goes from Great Britain to supply the wants of other nations. We have open to us a great field in which to work in this direction, the necessity of which we are more keenly alive to than ever before. The main obstacle for successful foreign competition in the disposition of cotton fabrics is due to the higher cost of the American product, as a consequence of the greater cost in the manufacturing plant, labor, taxation, and other expenses, not including the raw material. In the purchase of the latter, we stand at an advantage. American manufacturers are disposed to meet the peculiar requirements of foreign buyers whenever they find it to their interest to cater to this class of trade. They have been, and are, doing this right along.

The recent agreement among the Fall River mills, and the innovation introduced for the sale of print cloths, is reasonably expected to result to the pecuniary advantage of all concerned; but whether this will be the case, is a question of much moment among those who have given it careful consideration. The Southern competition in this line of goods is more to be feared than anything of the kind from foreign sources.

The woolen industry is far from being satisfactory, with no immediate prospects of a decided improvement, though there is a hopeful feeling, based upon the idea that the country is in a peculiarly prosperous position, which must be reflected in time upon the woolen, as well as other textile industries throughout the country. The woolen manufacturer has been obliged to contend against high prices for his raw material and low prices for his manufactured product. A concession in price, however, has recently been forced upon the wool dealer, which has resulted in a large movement of wool, and those in a financial position to do so, have in a number of instances, laid in large stocks of this material. Compared with the prices abroad, those existing in our markets are low, with the duty paid. The duty on wool obliges the manufacturer to pay, at least, eight cents a pound more than he otherwise would have to do in case he was permitted to enter the markets of the world without such restriction. The tariff on wool, however, adds but little to the cost of a suit of clothes, and in itself is of much less detriment to the woolen industry than the fact that the manufacturer is restricted in his selections of wool suitable for his wants, to meet the demands of trade, which are governed by the rules of fashion. It is estimated that about one-half of the productive capacity of the woolen mills is idle, which is a state of affairs that ought not to exist, and for which it would seem there should be some remedy.

—The M. A. Furbush & Son Machine Company of Philadelphia, have secured the contract for all the textile machinery, etc., to equip the first woolen mill in North China, which will be located at Tientsin. The mill will manufacture flannels and blankets; machinery will be finished and ready for shipment January, 1899.

Style Suggestions for Woolen Manufacturers.

The market is without doubt the quietest it has been in many years, and the lack of business is due to several causes, the principal one being the smallness of the light weight orders placed this season.

The curtailing of orders placed by the wholesale clothiers, has been due largely to the large stocks of light weight clothing on hand, caused by over ordering a year ago. The rush then to place orders, left many clothiers with more on hand than could be disposed of, and these large stocks have made the bulk of the trade change their method of doing business. Formerly, at the beginning of the season, wholesale buyers ordered what they considered a quantity of each style, sufficient to carry them to the end of the season; often times more was sold of one pattern than of another, and at the end of the season, certain patterns had either to be disposed of at a sacrifice or be carried over until the next one.

This season, the entire clothing trade changed the method of ordering, and instead of placing orders for quantities, only took sample pieces of each style, which accounts for the large number of single piece orders manufacturers have received. The buyers have pursued this method, trusting to being able to obtain duplicates, when they have sold sufficient to warrant the placing of them. This way is undoubtedly the safest way of doing business, and if followed will result in less financial difficulties than under the old way. These are the conditions which influence the light weight market, which is rapidly becoming a thing of the past, making way for the heavy weight season, which is sure to be a late one.

The past year has been an off one for kerseys, the large volume being displaced by the plain and fancy back coverts which have obtained such a large sale. There will be a demand for kerseys in the better and cheaper grades, the place of the medium priced kerseys being taken up by other fabrics. In these grades, fancy colors should be made, and in the cheaper grades, the higher the colors obtained the better will be their selling.

What bids fair to sell very largely, is a melton fabric, both in weight, heavy enough for overcoatings, also for suitings. The former should be 28 to 29 ounces, and the latter 21 to 22. The navies are the best colorings to make, and those which are olive, that is, grayish olive, are the most desirable, as are also the slate gray and regular gray mixes. In fact, these are good in any line of fabrics the coming season.

Coverts will have a large sale, particularly fancy backs, but the competition will be keen, and in making this fabric it would be well to bear in mind the existing lines, several of which have a firm place in the market. The fabrics which are the safest to make, are those with a ribbed face, where the cord stands up well, and backed with a bright plaid. These covert fabrics will meet with competition in the large number of fabrics, which will be placed on the market, containing cotton. While there will be a large sale of this grade, still the manufacturer who keeps clear of them, will do better, for in the better grades with less number of lines, there will be more profit. The plain back coverts will also sell, and in both fabrics there is no material difference in the colorings from last season.

In suitings, cassimeres and worsteds are the fabrics, and in both of these there will be a large quantity of twist used. Cassimere patterns will be neat, and the twist checks are the patterns to make, also the large indistinct plaids. The same is true of worsted patterns, and the only bold effects will be used in worsted trouserings.

The colors for both cassimeres and worsteds will be the darker olives and the blue slates and gray mixes. The predominance of twist will be marked in both cassimeres and worsteds, and

should be used freely in making samples.

Special to the Textile World.

Possibilities of the Philippines.

AS A COTTON-RAISING AND MANUFACTURING COUNTRY.

The Philippines as a cotton raising and cotton manufacturing country on a large scale may sound Utopian; yet, it is far from being so.

Cotton has been grown in a wild state in the Philippines from times long prior to the arrival of the Spanish. It was in general use among the various tribes of the archipelago, and even for a considerable time after the settlement of the islands eighty per cent. of the cotton cloth used in them was of local production. Necessarily, the culture of the cotton was of the crudest and the looms were of the simplest character.

The introduction of European goods rapidly displaced the native manufacture but even to the present day many of the tribes, especially in the remote regions, use material of their own manufacture in preference to the imported goods. A few farmers still continue to raise cotton on a small scale and they have been successful in obtaining large crops. Instead of using the cotton gin they persist in their antiquated plan of separating the seed from the fibre by hand. The result has been very expensive cotton and very small profit to the growers. The precise value of these native-made cotton goods is not forthcoming, but the French Consul at Manila reported to his government that the value of what he termed the "cotton textile industry" of the Philippines amounted in 1897 to "many millions of francs."

There are three so-called cotton plants which exist in the Philippines. One of these is the Ceiba Pentandra, originally known as the Bombax Pentandra. This is a wild cotton of the Bombacaceae family. The other two are true cottons, namely, the Gossypium, and a plant belonging to the Malvaceae family. As the Pentandra, or wild cotton, does not produce a fibre that is susceptible of being easily woven into a thread it is probable that the natives used the product of the true cottons.

It does not require any harmful stretch of the imagination to perceive here the possibilities of an extensive industry. There is no doubt that the true cotton plant can be successfully cultivated and the climatic conditions of the islands, especially of Luzon, are peculiarly favorable to the raising of a long staple product. The natives of the islands, naturally devoted to the arts of peace, and intelligent, have a peculiar faculty for imitating designs and, as shown in their native handicrafts, they are natural weavers. With the assurance that cotton can be successfully grown it is a very short step to the erection of mills and factories and the creation of a large trade in textiles. In the neighboring Asiatic markets there is a demand for cotton goods which might be supplied from the Philippine looms, to the immense gain of the people and the profit of enterprising men who should embark in the business.

Some of the material woven by the Filipinos out of native fibres are remarkable for their softness as well as for the skill with which the work is done. One of the most popular of these is the famous "pina" fabric, a material woven very finely from the fibre of the pineapple. This fabric is used for undershirts and by the women for fancy costumes. The essential characteristic of the natives, patience, is well illustrated in the exquisite embroidery with which they adorn their garments of home-made cloth.

Americans are familiar with the Manila hats and the cigar holders, mats, and similar fancy articles woven by the expert fingers of the Filipinos. The material out of which these goods are made is obtained from the "Buri," a species of palm very common in the islands. The part of the tree used is the fibre obtained from the young leaves from the top of the tree. The preparation of this fibre is done in the crudest manner. After being cut the leaves are spread

in the sun to dry. Then the central rib is removed and the leaf flattened and rolled by means of a round piece of bamboo. It is next twisted into braids according to the size required. Another plan is to put the leaves in vinegar after they have been separated from the rib until they fade. They are then put to dry in the sun. When dried they are plunged into running water for twelve hours and then spread to dry again. Subsequently they are dipped again for a shorter period and are left exposed to the night dews, which has the effect of giving them a clear white color. After these operations the leaves are ready to be made into hats.

It takes a worker about four hours to make a hat of ordinary size, six hours for one a little larger and about ten hours for a really fine hat. The remuneration they receive for their labor is equivalent to from four to eight cents American for common hats; from nine to twelve cents for hats of a better quality, and from 18 cents to $2.50 for the best hats.

From the heart of the Buri also is obtained a delicate fibre called "buntal" which is used in making wearing material and fine goods. The work is tedious and is generally done by women who when picking the fibre, protect their fingers by means of shields of leather. The fibres are well washed in water and vinegar and put in the sun to dry. When thoroughly dried they are rolled around a spool and classified according to their degree of whiteness and fineness. A working woman of ordinary capacity can make two buntal hats in a week, receiving 24 to 35 cents for the common ones and from 50 cents to $5.00 for the very fine ones. The latter, however, require a great deal of time, work ceasing when the temperature is very high because of the liability of the fibre to break.

This industry, intelligently taken hold of and concentrated in large factories, might be made to provide employment for thousands of the people, considerably augmenting their own and the general revenue of the islands.

The manufacturer of textiles may properly look to the Philippines for considerable augmentation of his trade. The restrictive Spanish tariff barred him from that market heretofore, the extent of the exportations of American-made cotton goods in 1896 being represented by $9,714. During the same year cotton goods valued at over $5,000,000 were imported from Spain. The principal goods comprised piece goods from Barcelona, admitted free if imported in Spanish vessels. These goods were formerly supplied by England. It will be of interest to the readers of the Textile World to mention here some of the fabrics most in demand.

The prices given were the importers' quotations to the wholesale trade dur ing the first week of April last. The unit of value taken was the Mexican dollar.

White shirtings, 27 to 34 inches wide, 40 yards. Low, medium and fine qualities sold at $4.50 to $6 per 40 yards. Gray shirtings, 35 inches wide, 35 yards, weights about 8¼ lbs. Low, medium and superior qualities. The two former qualities sold at about $3.25 to $3.75 per 40 yards.

Gray longcloth, 28 inches to 30 inches wide, 35 yards, weights 7½ to 8½ lbs. Ordinary Spanish qualities are quoted at $3.50 to $3.75 per 40 yards.

Gray drills, 25 inches to 36 inches, 30 yards, weights 8 to 10 lbs. Low, medium and good qualities. For the two former grades $3.50 to $4.00 per 32 yards was quoted.

Gray "T" cloths, 24 inches wide, 24 yards, weights about 6 lbs. For medium Spanish makes $1.87 to $2.25 per 24 yards was quoted.

Yarns, Spanish make 30s, 40s, 50s, white met with a good demand. Gray yarns were also imported. Dyed yarns 22s, yellow sold at $90.00 to $92.50 per bale, and the same counts in green and orange sold at $95.00 to $97.50 per bale. Turkey red yarns, 24s, sold at $115.00 and $120.00 and 30s at $125.00 to $130.00 per bale.

Trouserings, 24 inches, 30 yards, were quoted at $3.00 to $3.50 per 30 yards.

White cotton drills, 25 inches, 30 yards, sold at $0.21 7/8 to $0.25 per yard for superior English makes.

White croydons, 24 inches to 25 inches, 20 yards, medium Spanish qualities were quoted at $1.62½ to $1.87½ per 20 yards.

Ginghams, 24 inches to 32 inches, 20 yards to 24 yards for ordinary 24-inch Spanish goods $2.37½ to $2.50 per 20 yards was quoted.

Wove checked muslins, 24 inches to 25 inches, 10 yards, $0.81¼ to $0.87½ was paid per 10 yards.

Sarongs, 40 to 74 inches are always saleable.

White jacconets, 29 to 30 inches, 20 yards, medium to fine qualities, sold at $2.00 to $2.50 per 20 yards. Cambayas, 36 inches to 40 inches wide.

Victoria lawns, 32 inches wide, 10 yards, medium qualities in demand at $1.96¼ to $1.31¼ per 10 yards. Bishops lawn, 26 inches to 36 inches imported in pieces of 10 yards.

White Swiss checks 23 inches wide, 10 yards, $0.87½ to $1.00 per 10 yards.

Prints, 23 inches to 25 inches, 24 yards found a large sale among the native classes. These goods are generally gotten up in striking colors, in which red and yellow predominate. Printed jacconets, 22 inches to 23 inches wide, 10 yards for ordinary white grounds, $0.59⅜ to $0.68¾ per 10 yards was paid.

The military tariff provided by the Philippines, which went into operation when the American arms occupied Philippine territory, levies the following duties. (The gold peso remains the monetary unit and its value is $1.034. The kilogram is equivalent to 2.2064 pounds.) Raw cotton, per 100 kilos, .24 pesos; cotton yarns, spun or twisted in one or two threads, unbleached, bleached or dyed up to No. 35 inclusive, per kilo, .25 pesos; the same for No. 36 and upward, per kilo, .35 pesos; the same twisted with three or more threads, unbleached, bleached or dyed, per kilo, .50 pesos.

Close woven tissues, plain, unbleached, bleached or dyed, in the piece or in handkerchiefs up to 25 threads inclusive, per kilo, .20 pesos; the same up to 35 inclusive, .32 pesos; the same with 36 threads and over, per kilo, .44 pesos.

Tissues, printed, twilled, and figured in the loom, up to 25 threads inclusive, per kilo, .25 pesos; the same up to 35 threads inclusive, per kilo, .40 pesos; 36 threads and over, per kilo, .55 pesos; transparent tissues such as muslins, cambrics, etc., up to 30 threads inclusive, per kilo, .44 pesos; the same up to 31 threads and over, per kilo, .64 pesos.

Quiltings and piques pay .50 per kilo; velveteens, corduroys, and other thick tissues for wearing apparel, .52 pesos per kilo; tulles, 1 peso; lace except crocheted, 1.25 pesos; crochet lace made by hand or in the loom, .70 pesos; hosiery piece goods, jerseys and drawers, .50 pesos, and hosiery in stockings, socks, gloves and other articles pay .60 pesos per kilo.

In addition to the duty on raw cotton, and on cotton yarns, there is a surtax of 25 per cent. on the duty, and on the close woven tissues, the printed and figured tissues of 36 threads and above, the transparent tissues up to 30 threads, and lace except crochet pays an additional surtax of 20 per cent. on the duty.

The duties on linen and woolen goods are approximately the same.

Scientific Investigation of Cotton.

Editor Textile World:

In the October number of the Textile World, under the caption "Scientific Investigation of Cotton," the manner in which the fibre is injured in the process of manufacture, is plainly stated. A ginning experience covering twenty years, convinces me that the cotton fibre receives its first serious injury in the process of ginning. Having no experience with roller gins, I am not competent to discuss their advantages over saw gins. But if the seed cotton is treated and ginned according to the following formula, I believe, be the fibre long or short, that it will come from a saw gin in quite as good condition as any

roller gin will be able to deliver it.

First pass the seed cotton through a cleaner, which will "open it up," and remove the sand and dirt. Second, pack it down on the gin-house floor, and with a sprinkling pot, wet it with ten per cent., by weight, of pure soft water; cover the pack with a tarpaulin to exclude the air and protect it from dust. The pack should remain until the fibre has absorbed the water. Then pass it through the gin. To enable the gin to do perfect work, kerosene oil should be applied to the roll as the ginning proceeds. Two gallons of oil will suffice for each 500 pounds of lint. Fibre ginned by this, which I name the wet process, will show greater strength than the dry cotton did before treatment. If cotton spinners could see their way clear to take their cotton from the plantation in the seed, in place of in the bale, and gin it by this process along side the mill as it is needed for spinning, I believe that sixty per cent. of the cleaning machinery now used in cotton mills could be dispensed with.

Again the saving in cost that would follow the handling of the cotton crop in the seed and in bulk, as opposed to the present plan of moving it in the bale, will justify any spinner in beginning the reform. By this process the output of an eighty saw gin will be from 2000 to 2500 pounds of lint in ten hours.

C. H. MERRY.

St. Louis, Mo.

[The relative merits of the saw gin and the roller gin have not yet been scientifically demonstrated. Much that has been said against the saw gin is misleading, and the damage that it does to the cotton fibre is due, in a large number of instances, to the improper use of the machine, where the operator has endeavored to overcrowd it or tax its capacity beyond its proper limit, resulting in well known injuries to the fibre. Almost invariably, this machine is run at too great a speed, for the purpose of adding to its production, without regard to the quality of its performance. The roller gin has not been used, to any extent worth speaking of, in the ginning of upland cottons. While the mechanical operations of the roller gin are easier upon the fibre than those of the saw gin, it is not difficult for any good mechanic to see that the machine can be run in a manner and at a speed that will do injury to the fibre. Mr. Merry's idea about wetting the cotton for any advantageous purpose, looks to us as rather chimerical, and the use of kerosene oil, as he suggests, decidedly so. Any combustible material of this kind is generally avoided and removed as far away from cotton as it is possible. The suggestion of Mr. Merry for manufacturers to buy their cotton in the seed, has been discussed in our columns before. We think that spinners will never favor Mr. Merry's idea in this particular.—Editor.]

The Manufacture, Use, and Care of Loom Harnesses.

[Illustrations Specially Prepared for Textile World.]

Paper read at the Crawford House Meeting of the New England Cotton Manufacturers' Association.

In order to present clearly the different styles of loom harness, I have prepared samples, which will be distributed, each kind by itself. Number 1 is the hand-made harness in general use up to 1846, when the first machine for making loom harness was invented. You will see by this sample that the eye is formed by a double knot at the top, with both legs of the heddle on the same side of the shaft. The bottom of the eye is made by loops, which stride the shaft or one leg on each side. The loop side of the harness was often loosened by the drawing-in process, when the drawer-in forced the hand between the legs of the heddle and as near the bottom of the eye as possible, in order to control the eye of the harness while drawing in. The loop side of the harness formed this way, was always the

weak side and would give out when the rest of the harness was good, as when loosened in the loop the harness soon became useless.

Up to this date, 1846, little or no improvement had been made in the manufacture of loom harness. About this time a Scotch machine was produced and used to some extent in this country, which made the easy side, so-called, or loop side of the harness, but still left the most difficult, or knot, side to be made by hand. Also a little later a machine was invented and used in Sacarappa, Me., which made a harness by braiding several threads together leaving the eye in the center, which was kept open during the process of finishing by a wire running from end to end of the harness. This harness had some good points, but after running for a time the tendency of the eye was to close up and catch the warp yarn and chafe and break it. This harness never came much into use and the main reliance for the production of harness was still by hand. At this time harness was about three cents per bier.

Early in the fifties, John Kendrick opened a shop in Providence, and employed about 60 girls to knit harness by hand. Two kinds of wooden needles were used, one for each side of the harness. Filling these needles with twine by hand was a slow process. At this time a winding machine was brought out for the purpose of filling these needles by power, for which a large price was paid (about $10,000). This machine enabled a girl to wind for thirty hands, which was a great saving and enabled the harness maker to reduce the price of the article about ten per cent.

About 1855 or '60 there appeared a hand-made double knotted harness, with knots at both top and bottom of the eye. This harness was intended as an improvement upon the loop harness, then in general use.

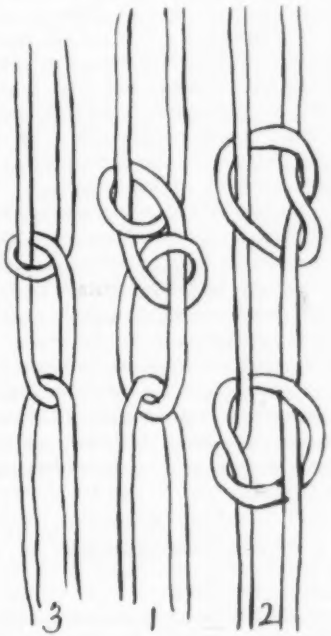
This harness was made by Gray & Fish, Worcester, Mass., by Willard Leavens at Danielsonville, Conn., and John Kendrick, Providence, R. I. These harnesses were on the market for several years and although superior in some ways to the loop harness, the expense of manufacture was too great to allow of their general use, and their manufacture was finally abandoned, and the ideal harness was yet to be brought out.

The next that appeared was the so-called double knot harness, Number 2. This harness has a double knot at each end of the eye and exactly alike. This did away with the loop described in Number 1, and produced a harness just as lasting at the bottom of the eye as at the top. This proved a strong durable harness. The machine for the manufacture of this harness was invented by Joseph S. Winsor of Providence, in 1846, and was the first machine in the world to make a complete harness automatically. This machine being patented, and the owner not caring to allow others to use his invention, other makers were forced to find some way to produce a harness that could, if possible, prove as good as the double knot, as that was taking the lead in the market.

The next sample, Number 3, was made on a machine made in England, invented by Joseph Sladdin and called the Bolas machine. Sladdin later came to Lawrence, Mass., and under the firm name of "Sladdin & Lord," improved the Bolas machine, built several and put them on the market. This machine produced a harness similar to the hand-made loop harness, Number 1, except the top of the eye was made by a single knot instead of a double knot, but the bottom of the eye was still a loop. The bottom legs of the eye strided the shaft, which left it open to the same objection as the hand-made harness in its liability to work loose.

There is a later improvement, which reverses the eye of the harness, putting the loop at the top of the eye, and both legs the same side of the shaft, and the knot at the bottom where the legs stride the shaft with less danger of working loose in the loom. The loop being at the top, both legs of the heddle being on the same side of the

shaft, the effort is made to fasten the two legs together as far as possible, thus to prevent the loops getting loose. When the legs of this loop are perfectly fastened it has much the same effect of a double knot as is intended; but perfection in fastening the loops is somewhat difficult. Some have an idea that knotted harness creates more friction on the yarn, but the peculiar construction of the knot is such that no extra chafing is caused, and the experience of 50 years has proven that this harness will weave



No. 1, is the original hand made, now out of use, but is something of a curiosity, as it was in use from the early time of hand loom weaving to about 1860. No. 2, is the double knot harness now largely in use. No. 3, is the loop harness as now made. Nos. 2 and 3, are the kinds now in almost universal use all over the world, where cotton harnesses are used.

any goods made in the country that any harness will weave, and that it is a strong and durable harness no one will question who is acquainted with the facts. I have no intention to question the value of the different kinds of harness being made. As all patents have expired, any harness maker can purchase any and all the different machines in the country.

When the loop harness machines spoken of in this paper were put upon the market, it was claimed that they infringed the patent on the double knot machine, for which the owner, Kendrick, had paid a large sum. The matter was finally referred to the United States Court, who decided in favor of the plaintiff. This decision made it possible to stop most of the harness machines in the country, but that would have worked a hardship on both the harness maker and the manufacturer. There were also other patents brought into the country from England, which, with those already here, promised endless litigation and expense. As all harness makers in the country were dependant on the use of some one of the machines for their business, it was mutually agreed to form an organization of all the harness manufacturers for the purpose of buying these patents, which was done, and these patents put into the hands of three trustees to be held by them during the life of said patents, and during the said term all users of these patents (not owners) paid into the hands of the trustees a royalty on each bier produced, to be paid to the owner of the patents as reasonable compensation for the money they had expended in obtaining their patent rights. This plan was carried into effect and a reasonable price fixed at which all harnesses should be sold, and this action ended what might have proved a long and expensive contest in the courts.

It is not always that an organization of this kind lowers the price of goods produced to the consumer, but it did in this case, for while the harness manufacturer had the power to fix the price on an article the mills must have, they actually made a lower price than had ever been known before, giving a large part of the saving between hand work and machine product to their customers. In no branch of manufacturing has there been greater improvement than in that of loom harness.

Formerly harnesses were varnished in the mill by the overseer of weaving,

and it was a common thing to see a section hand brushing a harness for an hour or two with tallow before drawing in, and nothing was dreaded more by the weavers than a warp with a new harness, but now a weaver would rather see a new harness coming to her loom than an old one, and it would be impossible to run looms at the present speed in those days. Harness makers should have the credit of making the present speed possible.

In ordering harness it is important for the maker to know the number of warp yarn to be used, which enables him to better determine what size of twine to use in the harness. It is a common thing for a mill to order harness for fine yarn, and not mention the fact that fine yarn is to be used, and the harness maker uses a twine suitable for weaving number 30 to 36 yarn, supposing the mill is to weave same cloth as usual, while it is possible the mill intends to use number 60 to 70 yarn in the warp. This causes considerable trouble which could be easily avoided. It is also a common thing for mills to order harness ¼ to ½ inch wider than reeds. This makes considerable friction on the selvages, just where it ought to be easiest, and all harnesses would give better satisfaction if they were made exactly same spread as the reeds.

In England they give a great deal of attention to the setting of a loom, just the right tension to the harness and never depressing the harness so as to bring the warp against the lathe, but as near to it as possible and not touch, and then the swell in the shuttlebox is just right, not too much tension, and the check on the picker-stick is adjusted so as to take off all jar and save extra wear and the pickers. In this country it is a common thing to see a harness jacked up so tight that it will wear out twice as fast as it ought to, and cause friction on the warp and wear out strapping; then the harness is depressed so low that the warp is brought down onto the lathe, the swell in the shuttlebox so tight that in order to drive the shuttle the picker-stick is made to strike so hard as to often break the picker-stick and to wear out the pickers.

About ten years since a loom harness association was formed composed of nearly all the harness makers in the country, the price fixed at which they would dispose of their product. The price was put at 2¼ cents per bier of 40 eyes. This was a low price when it is considered that the twine used is almost entirely made of long staple cotton and combed. On fine work, Sea Island is the twine used by most of the harness makers without extra charge. Of this association nearly one-half have been compelled to abandon the business as unprofitable, and those that are left are compelled to give the business their closest attention in order to get any returns for their investment.

John Kendrick of Providence, R. I., T. A. Emmonds, Lawrence, Mass., and G. W. Harris, Lowell, Mass., are the pioneers in the loom harness business, and they or their representatives are still in the business, and their ranks have been increased by others who have learned the business thoroughly; but scores have in the last fifty years attempted the manufacture of loom harnesses who knew little or nothing of the business and have utterly failed and disappeared.

Cotton Investigation.

Editor Textile World:

Regarding Edward Atkinson's interesting article on "Cotton Investigations," I will give at least one fact in confirmation of his views about lappers.

Some years ago a yarn mill abroad which had already a reputation for strong weaving yarn, had a patent grid with stationary comb applied to the lappers. As expected they got on the intermediate lapper at least as clean laps as before on the finisher, and therefore eliminated that machine, expecting to get stronger yarn. They were in the habit of making and registering every day several yarn tests from every spinning machine,

and the average of thousands of single tests before and after alteration showed an increase of 7 per cent. in strength. They passed the cotton through a Buckley opener combined with one beater and two single beater lappers, one of which was now left out. As the beater blades were purposely kept rather blunt, and as they were set unusually far from the feed rolls (⅜ to ½ inch), with moderate speed of beaters, this increase of strength by 7 per cent. may, therefore, be taken as a minimum to be obtained by eliminating a beater, at least, when introducing the above mentioned grid at the same time. For part of the result was no doubt due to greater evenness of the lap, inch for inch, which is always a result of a well devised grid.

I may here point out that a slight increase in evenness of the cotton as spread over the cages of the finisher lapper gives a much greater increase in evenness of card slivers. This is so because of the slight draft which always exists between cages and calender rolls, between the latter and the lap motion, and again on the cards between lap rolls and feed rolls, and between doffer and coiler, besides similar drafts at the back and front of drawing frames. For, as these drafts extend over a distance of 4 to 12 inches, instead of only slightly more than the length of staple, as practiced between regular drawing rolls, the lap is at the first draft stretched principally where it is the weakest. At the second draft the stretching is still more confined to the same weak spots, and so on with lap and sliver on card and drawing frame. If the cotton is more evenly spread on the cages to start with, these drafts have each of them less injurious effects.

There are other mills which, after the introduction of an improved grid, have left out one or two beaters, but they have either made no yarn tests at all in connection with the change, or not a sufficient number to give a reliable average.

ROB. SCHAELLIBAUM.

—The first textile fabric was probably made of wool.

[*Special Correspondence.*]

Paris Exposition.

France will hold its next Universal Exposition in 1900. The gates of the Exposition will open on the 15th of April, and close on the 5th of November of that year. On the date of the opening, eleven years will have elapsed since the last great Fair attracted hundreds of thousands of people to Paris. The Exposition of 1900 will have a dual importance. Not only will it be as significant and important as are undertakings of this kind, but it will coincide with the close of the nineteenth century, which has been so remarkable, both from scientific and economical points of view, and will inaugurate an era that may perhaps, prove still more productive.

France organized the first exposition ever held, and it seems but natural that it should claim the honor of bringing the century to a close by an impressive manifestation of peace and industry, to which all civilized nations are invited. It was on July 2, 1892, that the Chamber of Deputies passed a decree to hold this universal exposition. From that date steady progress has been made in the great work. All the difficulties of the first days have been vanquished and all the immense detail of the important problems are now solved. On the 15th of April, 1900, after a period of almost eight years of the most difficult work, there will be assembled at the Paris Exposition all the vital forces of humanity, and the new century will be inaugurated by a wonderful and stately review of the inventions and improvements with which the last years of the past century have inspired the genius of man.

The amount of space that will be occupied at the Exposition with buildings and palaces, landscaping and gardening, will be in the neighborhood of three hundred acres. Great as is this aggregate of space, it is not nearly sufficient to meet the demands. A great amount of this room will be

on the right bank of the River Seine.

A committee on finance, at the very start of the Exposition, arrived at the conclusion that one hundred million francs (twenty million dollars) was a normal estimate of the expenses of buildings and running the Exposition. This amount was adopted by the high commissioners of Paris, in July, 1895. The estimate of 100,000,000 francs is justified by the French Commissioners for several reasons, the foremost among them being the extraordinary eclat the French Government will give the great fair, the liberal participation in the Exposition on the part of foreign powers and the permanent embellishment with which the Exposition will endow the city of Paris. It is expected that the receipts will be far in excess of what they were at preceeding expositions.

The several international expositions that have been held in Paris within the last thirty years have given the following results, as to gate money:

The Exposition of 1867, 10,765,000 francs—($2,553,000.)

The Exposition of 1878, 12,575,000 francs—($2,515,000.)

The Exposition of 1889, 21,834,000 francs—($4,316,800.)

Careful calculations show that the amount of money spent in Paris by visitors during the Centennial Fetes in 1889, amounted to 125,000,000 of francs. The receipts of the railroads in France in 1889 increased over all other similar periods, about 78,000,000 of francs, arising in the greater part from foreign visitors, and the increase of 7,000,000 francs in the receipts of the postal and telegraph departments is another illustration of the fact that these expositions are profitable to Paris and to France.

The admission to the 1900 Exposition will be one franc—(20 cents). It is estimated that 60,000,000 francs, or $12,000,000, will be received from the admissions in 1900. It is now estimated that the total expenses of the Exposition will be 106,785,000 francs, or $21,254,000.

Out of the 55 countries that have been invited to participate in the Exposition, Egypt is the only country that will not take part.

The original allottment of space to the United States was about 150,000 square feet. The late Special Commissioner, Moses P. Handy, had that increased to 200,000 square feet. Commissioner General Peck has been in Paris for the past two months endeavoring to secure more space. A cablegram from him recently announced he had secured 30,000 square feet additional, and it is believed he will yet secure for the exhibitors of this country over 300,000 square feet in all. The space allotted to the United States at the Paris Exposition in 1889 was 122,697 square feet. At the same exposition Great Britain and her colonies were given 230,737 square feet. The applications for space, and the numerous requests for information of all kinds as to the Exposition, at the headquarters of the Commissioner General in New York City, which are in the Equitable Building, 120 Broadway, is good evidence of the great interest business men and the public generally are taking in this great International Fair.

The Clemson Textile School.

We have been favored by the director of the textile department, J. H. M. Beaty, of the Clemson Agricultural and Mechanical College, Clemson College, S. C., with a prospectus of the textile department of this institution. The course laid out for this department comprises a system of liberal education and culture. The first two years of the course are the same as those of the mechanical department of the college. The object has been to make a course in which the student will not only be given special knowledge and training upon textile subjects, but will at the same time receive the advantages of a good general education. The third and fourth years embrace practical work on all of the machines in the department,

and lectures timed to suit this work, giving an insight into the selection and preparation of stock, opening and picking, cleaning, carding and spinning; also preparations of yarns for weaving, including slashing and sizing compounds; also drawing-in loom effects and weaving, and the calculations necessary to make complete changes of work throughout the mill. The plan of the building and arrangement of the machinery is according to well-known mill construction. The machinery and names of donors are given in the following list:

1 combination opener and finisher lapper, A. T. Atherton Machine Co.; 1 card, 40 inch revolving flat, Saco & Pettee Machine Shop; 1 card, 40 inch revolving top flat, Mason Machine Works; 1 railway head, Saco & Pettee Machine Shop; 1 drawing frame, Saco & Pettee Machine Shop; 1 draw frame, Mason Machine Works; 1 slubber, Saco & Pettee Machine Shop; 1 roving frame, Saco & Pettee Machine Shop; 1 spinning frame, Saco & Pettee Machine Shop; 1 spinning frame, Mason Machine Works; 1 spooler, Draper Co.; 1 twister, Draper Co.; 1 warper (beam), Draper Co.; 2 Northrop looms, Draper Co.; 1 plain loom, Mason Machine Works; and 1 7-box pattern loom, Mason Machine Works.

We will add that the school intends to include dyeing and fancy weaving in the near future.

A New Loom.

There has recently appeared in the daily press, as the result of a communication from the United States commercial agent at Roubaix, France, reference to a "new weaving machine," said to have been developed by the manufacturers of France, to meet German competition. The speed of the machine, it is claimed, surpasses the Northrop loom, and permits the use of ordinary material.

As a matter of fact, as near as we can ascertain, and which seems to be substantiated in the report of the United States commercial agent, this machine is nothing more than the semi-weaving and knitting loom known as the Millar loom, which was first described and illustrated in this magazine, of any textile publication in the world. The invention is an American one, and has been exploited to some extent in England, and a company for its manufacture attempted with large prospectuses, but with what success we are unable to say. To compare the loom, however, with the Northrop, is very far fetched, and the latter machine has no need of fear of competition from this source. We do not wish to imply that the Millar loom has not many meritorious features, but it has not been tested sufficiently in mill practice to entitle it to the claim of being a machine that will revolutionize the processes of fabricating cloth. Its permanent merits are yet to be demonstrated.

The United States representative at Roubaix admits that the working rapidity of the machine is the only point that it has in common with the Northrop loom, as the principle of weaving is absolutely different, and it produces a sort of knitting stitch. He says that, "on one side of the working machinery, the warp thread is disposed on its frame, and beneath this machinery is the tissue, which rolls itself up. There are also two arrangements of bobbins, one above the other, each carrying from 100 grams to 1 kilogram or more of woof yarn. One series of these bobbins supplies the straight thread and the other the chain stitch. They are both propelled by a similar movement by means of an endless chain, which moves along two parallel straight parts united at their ends by two round pieces. The two straight parts vary in length according to the width of the goods. When the bobbins, drawn by the endless chain, pass into the round pieces they cease to work, but when they are brought back to the straight parts, they pass before a plate which sets them in motion—one series supplying the straight threads and the other the chain stitch. Nothing could be more simple than the Millar machine, which substitutes the knitting motion for the ordinary shuttle.

"The texture shows the woven effect on one side and the knitted on the other; but the woven effect can be produced on both sides, and the chain stitch can be made less prominent in

wool or cotton goods by using four threads on the bobbin that feeds this stitch, and by fulling in drapery goods. The machine lends itself readily to weaving yarns of different color and quality, as the various bobbins can be supplied according to taste. Raw material of inferior quality can also be used, as there is little strain on the thread in this mode of weaving, the weft thread floating like that of a knitter. The production is astonishingly rapid; 120 to 200 meters can be woven in a day of ten hours. There is also great economy of hand work, one workman being able to oversee six machines. The motive force is perhaps one-half that demanded by the ordinary machine, the Millar having the motion of a sewing machine or of knitting needles."

Wage Reduction in Southern Mills.

"The daily newspapers have, during the past week or two, alluded to the subject of wage reduction in Southern cotton mills in language which conveys a wrong impression," writes a Southern correspondent to a local paper, who adds the following interesting explanation, giving the scope and application of an order reducing wages ten per cent. in certain Georgia mills.

"The mills affected by the order of the Georgia manufacturers, are all members of the Southern Cotton Manufacturers' Association, which is composed almost entirely of Georgia cotton mill men, and including in its membership, very few or none of the Carolina mills.

"Now about three-fourths of the cotton mills in operation in the South, are located in North and South Carolina, there being over two hundred in North Carolina alone, and though not half that number in South Carolina, the latter operates as many spindles as the former, the mills being considerably larger as a rule.

"In the two Carolinas there are nearly two-and-a-half million spindles, while Georgia has only about 700,000 spindles and Alabama less, these four States constituting the only really cotton manufacturing states of the South, as yet. Nearly or quite all the North Carolina mills, and most of the South Carolina mills, which belong to any trade organization at all, are members of the new Southern Cotton Spinners' Association, organized at Charlotte, N. C., less than two years ago. This organization has a larger membership than the older association, and although all the Carolina mills have not yet officially connected themselves with it, they generally abide by the decisions of the association and its board of governors. It has no connection whatever with the older Georgia association, and therefore the reduction of ten per cent. in the scale of wages ordered in the Augusta and other mills of that association does not in the least affect the 300 mills in the Carolinas. There is no indication of a reduction of wages in any of the Carolina mills. Both operatives and mill owners appear to be well satisfied with the wages now paid."

From Chemnitz.

Editor Textile World:

Incredible as it may seem, the quarter just ended, is one long to be remembered. A gain has been made. Chemnitz went far beyond what any one believed possible. The causes must be looked for in the United States. In the September quarter of 1897, there was a falling off from the September quarter of 1896, of $652,344. In the 1898 September quarter, there was a gain of $673,390. The figures indicate a difference between the positions occupied September 30, '97 and September 30, '98, of $1,325,734. Cotton hosiery increased over 100 per cent., woolen hosiery almost 400 per cent., cotton gloves 500 per cent., and woolen gloves 2500 per cent.

The situation, at present, in hosiery, is one of which Chemnitz manufacturers may feel proud. Nothing like the record of 1898, has ever been written. Despair, doubt, disgust were the only

words with which to describe the situation six months ago. Today everybody is busy. Fairly good orders were given during the last week by Mr. Colburn and Mr. Bodenheimer, of New York. The best orders, however, came by cable. These were large and numerous. Fancies, of a mild sort, went well. Plaids do not sell at all. Blacks, with white stripes in the $2.00 grade, are running very well. Last year the demand ran to as many colors in hose as the rainbow has shades; today the demand is for one and two colors, especially black with white. Petinets went well, so too, plain staples. Navy blues, tans, Rembrandts, Richelieus and ribbed went so well that orders booked now must go in against late delivery. Staples are improving. Hose and half hose, in split soles, maco feet, white heels and toes are taking well. Quite large quantities of embroidered goods have gone and are going. The prices predicted have not been reached. Why, I am not able to explain. As usual the biggest and best buyers were from the States. England bought quite large quantities for the colonial trade. The Orient bought well too. This may be a boom because of great events about to happen. All Turkey, Syria, Palestine, etc., are to put on holiday hose during the fete days of this fall. The emperor is going to Constantinople and to Jerusalem. Musselmen feel that they must make a good showing. Quite a number of knitting machines and about forty expert knitters went to the United States two weeks ago. They are bound for Fort Wayne. One, Nissen, was here picking them up and persuading them to go over. I hear that more machines are to go later. Prevailing prices, in the States, because of domestic competition, are ridiculously low. Merchants from the United States, keep telling us here, that competition with American knitters is practically impossible; and yet, exports are increasing. Cheap goods have fallen off, children's goods are not going at all to speak of.

The glove trade is passing through a most pleasant, because entirely unexpected, period of prosperity. Had any one predicted six or eight months ago the remarkable change that has taken place men would have wondered as to his sanity. Manufacturers will have hard work to fill orders, on time. A caution had come into glove manufacturing circles that kept up prices and minimized losses. Only such machines as were absolutely needed were bought or ordered. Hence there was no over production. As soon as a manufacturer had booked as big an order, or as many orders as he could consistently take on, he refused to book any more, even when urged to get more machines. This has helped, very materially, to reduce production and to regulate production and price. Had hosiery men done this, their situation would not have been so very unsatisfactory as it was during the first six months of 1898. Button gloves continue favorites. In fact, they are the only gloves wanted, especially for the States.

The underwear men have all they can control. The orders came in so early, five or six weeks, say some manufacturers, before the usual time, that there will be no trouble and no delay in filling orders. In this line everything goes. Regular all silk, half silk, and lisles went and are going as never before, and as nobody believed they ever would go.

There is little or nothing to add by way of "notes." I was in a gathering last night, at the "Kaiser," when a recent arrival from God's country, as most Americans call the United States, was telling about domestic doings in hosiery and underwear. The party was very emphatic in his belief that the United States are to emancipate themselves entirely, and soon, from the French and English markets. He said he was astonished at the class of work, quality of the goods, and prices. In six months he said, out of every twelve, the knitters of America can turn off hose enough for the forty-five States. Where are

the goods of the other six months to go? You must find markets not only in Manila, but beyond it, in China, India, South America, Australia, Africa, etc. Possibly you will. He said your knitters can compete now, on this continent, in coarse goods. He was an experienced manufacturer, not a man to talk merely for fun.

It may interest Massachusetts readers, in fact all New England, to know that there is a great revival here in the matter of technical education. Industrial, industrial art and technical schools, to the numbers of some hundreds have had an exhibition on in Dresden. The empire's energies are to be expended in efforts to give its people the very best industrial, industrial art and technical schools on earth. Every industry is to have its school.

J. BROWN.

Chemnitz, Saxony.

Memphis Cotton Exchange.

RULES GOVERNING THE SALE AND TRANSFER OF COTTON.

We have just received the 1898 Directory of the Memphis Cotton Exchange, which contains, among other valuable matter, the official rules and regulations governing the sale and transfer of cotton in the Memphis market. Succinctly stated, the general points of interest to our readers may be given as follows:

Re-sampling and examination by boring shall be performed after weighing. Three hundred pounds shall constitute a minimum, and 672 pounds a maximum, weight of a merchantable bale of cotton; but, if the light bales be received, an allowance of $3 per bale, shall be made to the buyer. Six ties only shall be permitted on each bale, unless an allowance is made of two pounds for every tie above that number. Examination by boring relieves the seller from any liability for reclamation on mixed, fraudulently packed or damaged cotton. The cotton sold shall be delivered to the buyer under cover, and can only be delivered otherwise, on condition that it is protected from rain and mud by the use of skids and tarpaulins, the condition of the weather and ground requiring it, during the process of delivery, and till removed. All bagging not absolutely essential to cover and protect the contents of the bales in a proper manner, shall be deemed unnecessary, and shall be removed from the bales before they are weighed, or a fair and equitable deduction made for the weight of such bagging. The usual side pieces which should consist of no more than a single one-half width of bagging, running the length of the bale, will not be considered unnecessary bagging.

Cotton Grading and Mixing.

Paper read by Arthur Whittam at the late meeting of the New England Cotton Manufacturers' Association.

The grading and mixing of cotton is one of the departments in a cotton manufacturing plant to which very little attention is paid by some mills, and as the quality of the yarn produced depends to a very large extent upon the amount of systematic care and attention given to this most important branch of the industry, it is plainly evident that skillfully grading and systematically mixing are an absolute necessity in all progressive manufacturing establishments.

When the planter brings his cotton to the market it is graded by a class of skilled experts, the cotton buyers as they are generally termed, who, although they may be entirely ignorant of the treatment to which the material is subjected in the subsequent manufacturing processes, have from long familiarity with the subject acquired a certain empirical knowledge of the conditions of value and preparation in which the different kinds of cotton are brought into the market and it is certainly surprising that valuations even when performed by different buyers so often agree in substance.

There are, however, several defects in the present system of grading,

which, to one who has to convert this same cotton into finished goods, very naturally strike him as matters of great importance, upon seeing the buyer pass upon samples and attach their grade without taking sufficiently into consideration such counterbalancing qualities as cut, nepped, twisted or curled fibres, etc. Many of these defects are attributable to careless and improper ginning whilst others are due to the natural conditions of its growth; and any single one obviously lessens the value of the fibre to the manufacturer.

Taking these things into consideration, and allowing for the difficulty experienced in fixing the price with precision, there are other considerations which serve to show that a difference in price does not always insure a corresponding difference in the workable quality of the cotton. Two samples of cotton having the same market price may be very widely different in actual value, as, for instance, a good color may work up for a defect in length of staple, or the value of an originally fine fibre may be reduced by an admixture of crushed and broken seed, so that samples valued alike may be very unequally adapted to the same purpose.

In some mills, and especially Northern ones, a large amount of attention is paid to these matters when purchasing cotton; and this is to a certain extent, one of the many reasons why the output of Northern mills commands as a rule prices somewhat better than those obtained for that of Southern mills.

In buying cotton, two important considerations should always be kept prominently in view, namely, the quality of goods to be produced and the necessary grade or grades required to produce the same. These matters carefully and intelligently adhered to, we then consider what is the best and most profitable system of mixing.

But before going further into this subject let us for a moment look into the custom practiced by a great many mills in the South of buying any cotton that is offered them for sale, provided of course, the price is consistent with its grade, never taking into consideration the grade of goods into which it is destined to go, apparently absolutely ignoring the fact that after carding, proper "mixing" or "blending" and careful selection of the raw material is the "sine qua non" of the yarn producing departments.

Of course a great many of these mills are on coarse work and the lowest grades of upland cotton can be utilized for their products to advantage if proper care and attention is paid to the adjustment of the machines in the different stages of the manufacturing processes. This being the case, tnen why buy better cotton than is really necessary? And a great many mills in the South are today paying not less than one-half cent per pound more than is absolutely necessary for the class of goods they turn out.

Another custom, the defects of which are obvious, is that of storing away the cotton indiscriminately and without the slightest regard to its grade, instead of placing all bales of like grade together and leaving them easy of access, so that when required for mixing they may be brought out in such lots as will secure the same blend until the cotton on hand is all consumed; thus maintaining uniformity in the quality of the resultant products of the mill.

It is customary in nearly all European mills to make a test of each purchase of cotton in order to find the average loss sustained the year round. In doing this a small amount of cotton is taken from several bales of each grade, or the different grades may be tested separately; these samples are then placed together and generally amount to from 200 to 400 pounds altogether. By taking a large amount, a better average of the percentage of impurities contained in the cotton is obtained. Then after carefully weighing, the cotton is passed through the various machines in the picker room and later through the carding engine, a record being kept of the weight of every lap or can of sliver after coming out of the machine. In

this way the actual visible and invisible losses can be obtained, and where each individual grade is tested separately, it enables the manufacturer to judge more intelligently on the number of bales of each grade to put into the mixing in order to secure the most economical results.

In addition to this, every bale before being used should be tested by the superintendent or some person thoroughly competent to judge on these matters, both as to length, strength and regularity and maturity of the staple, and any bale not coming up to the standard of its respective grade should be put one side, and rejected, or mixed with several bales of superior grade.

Now in reference to the methods of mixing as practiced by some mills, I would like to make mention of the fact that some Southern mills, and especially small ones, do not put down any mixing at all; but simply take the cotton directly from the bale and place it in the automatic feeder, and in one particular case I saw a bale of cotton being used which would be graded as strict, good middling, whilst the very next bale to be opened was of a much poorer grade, and would certainly not have passed for better than low middling. With this system practiced, or that of merely opening four or five bales and dumping them on the picker room floor in such a manner as to not even suggest of a mixing, one cannot expect to convert the raw material into good, or even fair, yarns.

Frequently the space that can be utilized for mixing is entirely inadequate, especially in the mills of old construction, and even in some more modern buildings the space intended for this department is certainly not large enough for a proper and systematic mixing to be laid.

Such being the case, however, it only remains to utilize whatever is at our disposal to the best possible advantage, and, in doing so, I would suggest as the best system to adopt the following, which, although of long standing, has proven by experience to be the best.

First—Decide on the number of bales of each grade you intend to put down, assort them proportionately and take, say a third of a bale from one grade, shake loosely, or if a bale breaker is used, place it on the lattice a small layer at a time, and, after passing through the breaker rolls, spread over the allotted space for mixing; then take a like amount from a bale of another grade and spread on top of layer number one, and so on until a part has been taken from a bale of each grade intended to be mixed, after which begin again on the first bale opened, taking about one half of what remains, and repeat until the first lot of bales have been mixed. Then open up another lot and lay it down in the same way, always taking care to avoid, if possible, having two bales of a like grade placed together. Whenever only one grade of cotton is used it is advisable to put down only a third of a bale at a time before changing to another bale, as in many cases there is quite a variation in the quality of cotton packed in a single bale, and the smaller the individual layers, the more uniform is the quality of the yarns obtained therefrom.

The mixing should then be allowed to stand as long as is practicable prior to being used; this enables the cotton to open and spread more uniformly and at the same time to absorb moisture from the atmosphere, which is most essential to good spinning.

This system of allowing a mixing to remain unused for some time necessitates, of course, two mixings of like grades to be kept, for as soon as one runs out it should be replaced immediately. This should also be allowed to stand until required for use.

Where a new mixing is made from entirely different grades of cotton, a second test is sometimes made by taking a vertical section of several hundred pounds of cotton from the mixing, or sufficient to enable its being carried through the various machines and a thorough test of the yarns produced therefrom made. This is then compared with the standard of the goods you wish to main-

tain, as it enables you to judge more intelligently whether or not it would be advisable to make any changes in any particular machines, of the preparatory processes. It is always advisable to keep a sample of yarn showing the standard of quality desired, since it frequently happens that over several weeks or months the quality of the yarn may be materially reduced; and while the difference in quality between the yarns produced in any two periods next to each other may be so small as to be practically unobservable, yet the deterioration from the standard sample would be strikingly great.

In conclusion, I would say that a short time ago I had a Southern mill superintendent tell me there was no necessity for putting down large mixings now-a-days, as recent improvements in cotton picking and carding machinery were so marked as to insure a first class yarn in nearly every respect, even if the cotton were delivered directly from the bale to the automatic feeder.

His views, of course, did not coincide with mine, and I can safely say from experience that without a proper system of mixing, strictly adhered to, which will enable us to secure a thorough blending of the various qualities, and the elimination as far as possible of the inequalities present in different bales, or in various parts of some bale, we cannot expect to obtain yarns uniform in quality, color, elasticity or strength, or to secure at the outset an economical production.

Wired Glass.

The adoption of wired glass in many places in the factory has become more and more general as its value as a fire retardent becomes more realized. It is quite important that this glass should be placed in proper frames and properly glazed. The credit of calling the attention of manufacturers to this glass is due to Edward Atkinson, president of the Boston Manufacturers' Mutual Fire Insurance Co.

Metal frames should be used in place of protected wooden frames, it being extremely difficult to so protect the wood that it will not char sufficiently to weaken. The metal should be riveted and not held together by solder. Wired glass of quarter-inch thickness may be used rather than heavier glass. Many frames are made hollow and are to be preferred. There are some patent-rights claimed on metal frames, but the hollow iron window frame was patented thirty or more years since. This patent has expired. Therefore, the principle of the hollow metallic iron window frame is free to any one to use. The patents can only stand on minor details.

The glass should be held in place by at least a half inch of the metal projecting over each side of the sheet of glass. Laying up the glass against a ledge and filling up on the other side with putty, with zinc points at each corner, will not suffice. Glass set in this way may be blown out by an expansion or an explosion within the building, or it may be forced in by a stream of water from the engine.

The glass should be put into a groove having a half-inch bearing of metal on each side. A little putty may be used to advantage merely to keep out the weather, but never should be used to hold the glass in place; preference may be given to asbestos, furnace or stove builders' cement.

In all possible cases the frame should be fixed, sliding frames being only used occasionally where it may be necessary for the passage of air.

Effect of Machinery on Labor.

The results of a thorough investigation, ordered by Congress, and just completed, showing the effects of machinery on labor and incidental questions, constitute the Thirteenth Annual Report of the Commissioner of Labor. The statistics of cost reported involve only the actual labor expense. The report goes into detail and, among other things, says: "There would be no quarrel with the conclusion that machinery has lowered the cost of pro-

ducts, and when it is known that under the machine method there is an increased demand for labor, as a rule, the bearing of the supply of labor becomes problematical. The statistical method, as in the effect upon wages, becomes indicative of the truth, and to those who believe machinery has, in general, lowered cost, conclusive. The statistics presented make evident that there has been a large increase in the number of persons required for the production of the articles considered, in order to meet present demands, than were necessary to meet the demands under the hand labor system.

Fertilizing ground required 25 hours under the earlier wagon and shovel method, and but one hour by the modern drill. In digging trees, the machine in general use reduced the time between one-eleventh and one-thirteenth of the old time, and in small grain harvesting, the self-binder has reduced the time for cutting, binding, and shocking to about one-eighth of that under the primitive system. In threshing, the ratio of time used is more than 32 to 1 in favor of the machine. In corn planting, the old method took nearly six times as long. One of the comparisons shows the manufacture of 1,000 one-pound loaves of bread is reduced in cost from $5.59 to $1.55, and in time from 28 to 8 hours; axle clips, 1,000 in quantity, from $233.33 to $4.27, and from 666 to 23 hours. In making 500 pounds of dairy tub butter, machinery cut the cost down from $10.66 to $1.78, and from 125 to 12 hours. In diamond cutting, machinery has reduced the time for four three carats from 132 to 39 hours, but increased the cost from $14.84 to $26.25. In lithographing the cost is cut from $92.87 per 1,000 copies of a specified size to $8.75, and time from 166 to 30 hours. In making matches the time is cut from 259 to 29 hours, and cost from $24 to $3. In printing and publishing magazines, 10,000 copies, the labor reduction cited is from 3,170 to 14 hours, and from $302.50 to $4.62. Cigarettes, 100,000 in number, manufactured by hand, in 1880 and by machinery in 1895, cost relatively $97.44 and $11.48, time 990 and 148 hours, the number of workmen also being reduced from 27 to 13. In mining 100 tons bituminous coal, the hand cost in 1891 was $77.60 and time consumed 342 hours: machinery reduces this in 1897 to $43.40 and the time to 188 hours, while the number of workmen also is reduced from 42 to 32.

Textiles in Mexico.

Mexico furnishes in cotton manufactures, alone, marked evidence of industrial progress. Authority of unquestioned reliability gives that country, according to reports to the Bureau of the American Republic, Washington, D. C., the credit of doubling the number of its cotton mills during the past few years.

In 1896 not less than 107 cotton factories paid tax to the Government. Of these, 3 were spinning mills, 6 were spinning, weaving and printing mills, and 6 were printing mills. The motive power of these factories aggregated 13,826 horse-power, and their mechanical outfit comprised 24 printing machines, 13,600 looms, and 448,156 spindles. They employed 20,994 men, women and children, and consumed 53,273,397 pounds of raw cotton. Half of the cotton consumed was from the United States, the remainder of home production. The output of these factories for 1896 was 7,116,547 pieces of cloth and 3,858,829 pounds of yarn and coarse thread.

While the cotton industry of Mexico is over 60 years old, the pioneer establishment dating back to 1834, it has not been until within recent years that any marked degree of development has been attained. The new era of industrial Mexico is marked by many other enterprises and is a welcome turn in affairs that makes for greater peace and security and for quickened civilization on the Western Hemisphere.

Flax, the cultivation of which has greatly decreased in the United States, is being cultivated in Mexico, not

merely for the oil product of the seeds, but linen is being manufactured from the fibre with as much application and care at Cuernavaca and San Luis Potosi as are jute, hemp, and cotton at Orizaba and Guadalajara, and it is an industry strongly protected by the Mexican tariff.

The best Mexican flax possesses that peculiar silkiness and lustre characteristic of the Irish flax and is grown near Cuernavaca. There is, in this city, one large linen mill, the daily output of which is 2,734 yards. Both steam and water are employed in motive power. Drills, hollands, ticks, sheeting, towelling, etc., are manufactured and sold in the country. The same proprietor has a mill at Mexico City of equal producing capacity.

At Orizaba are the Rio Blanco mills, turning out linen as well as cotton goods, while at San Luis Potosi is a factory of English origin, which makes sheeting, white goods of finer qualities, fine drillings, and dress goods, the output bringing from 40 cents to $1.50 per yard. All these goods are sold in the Republic.

The linen made in Mexico is by native labor, thus showing that the Mexican laborer is susceptible of the best training. The men soon learn to handle United States machinery and apparatus, and when the United States manufacturers of spinning and weaving machinery make up their minds to introduce their products and replace the English makes it will be found that the adaptive Mexican laborer is just as much at home with the one as the other.

Linen goods were manufactured in the Republic in 1829 to the amount of 3,800 pounds, increasing in 1896 to 100,000 pounds.

Cotton Industry of France.

From a French report recently published, it appears that the capacity of French spinning mills did not appreciably increase in 1896. The number of new spindles in the north is estimated at 25,000, and in the east at about the same figure; but, taking account of the old spindles which may have been destroyed, it is apparent that 5,400,000 spindles represent approximately the capacity of French spinning mills.

As regards the trade in foreign cotton yarns, France imports less and less quantities every year. The figures before 1890 averaged 12,000 tons; in 1896, the imports were 4,589 tons. At the present time, the quantity of cotton yarns imported by France is scarcely equal to 3.5 per cent. of the domestic production. Still less cotton, however, is exported—less than one per cent. of the French production. The French yarn industry, therefore, depends on domestic conditions.

It is estimated that in 1896 France exported about 27,000 tons of cotton textiles. The output of French spinning mills being about 130,000 tons, it may be said that the export trade in cotton textiles represents more than one-fifth of the total production of France.

The exportation of plain and plaid cotton textiles is increasing. The ascendant movement is marked and rapid, and one is inclined to believe that the products of the French cotton mills have an importance on the international markets of the world. Such an idea, however, is misleading, for it must be borne in mind that of the quantity exported 12,000 tons or more are destined for colonies and markets reserved to French industry. Only the balance—6,500 tons, valued at $5,000,000—comes into the world's markets to compete.

A Significant Fact.

It is a fact of peculiar significance that nearly all the manufacturers who are having good business at the present time, and running their mills full, and indeed some of them overtime, are those whose plants are fitted up for some special line of goods, to which they give their close attention.

Take the Fletcher mills for example:

Each one is adapted to turning out its special product, and everything conducive to perfection and economy in that particular line is sought after, with the result that cost of production is brought down to the lowest possible notch, aided, of course, by the large capacity and corresponding reduction of fixed charges per yard.

The lot of the manufacturer, who, with a small plant, is ready to plunge into any line of goods that his commission house may suggest to him, is an unfortunate one in these times, especially if he is not able to figure out very closely just what he can do. Too many manufacturers jump at conclusions and because their selling agent tells them that a competitor is showing a certain line of goods to sell at a certain price, the manufacturer jumps at the conclusion, that if others can do it, he can, and trusts to luck to come out all right. Every mill has its limitations, and the successful manufacturer is the one who knows what his plant is capable of producing economically and keeps clear of everything else.

Colored Designs on Woven Fabrics.

J. Heilmann & Co., of Mulhouse, Alsace, have recently patented a process for the production of colored designs on fabrics woven with embroidery-like patterns. For some years fabrics have been woven so as to show raised designs like embroidery work on a plain ground. These fabrics are made in plain white, and sometimes woven in colors, the white fabrics being dyed in plain colors if desired, according to the usual methods. Imitations of fabrics woven in colors have been produced by printing so as to show white designs on a colored ground. This has been effected by applying the color on the back of the material in the form of a thick paste, so that it may impregnate the ground, but not the raised or embroidered part, the fabric being then dried and fixed in the usual way —for example, by steaming. Up to the present, however, it has not been possible to produce woven fabrics having embroidery-like designs with colored designs on the raised portion, and the present invention consists in the production of such colored fabrics. In carrying it into effect a woven fabric is taken having an embroidered design. This fabric should be entirely white, and the invention consists in applying to the raised design a different color to that of the background. A resist is placed on the back of the fabric, which is then dried, and a new color is printed on the other side, which is fixed in the usual manner—for example, by steaming. As the resist prevents the color from being fixed in the background, only the raised part eventually becomes colored. By washing, the resist and the unfixed color are removed, and colored designs are effectively obtained on a white background. The effect can also be carried out by the discharge process. The fabric is dyed with the color which it is eventually desired to obtain on the raised portions; the back is then padded with the discharge, and the fabric then passed through the discharging bath in the usual way. Example 1: The back of the material is padded with thickened acetate of lime, dried, and the other side is then either padded or printed with an ordinary aniline black, which is developed either by ageing or short steaming. Example 2: The material is dyed with direct azo colors, the back is padded with a thickened tin salt discharge, followed by steaming and washing. It is possible to start with a fabric previously dyed in any single color, the effect being that the new colored designs are on a colored background; but care must be taken that the coloring matter on the dyed fabric originally taken does not interfere with the action of the resist. A more practical method of producing colored raised designs on colored backgrounds is to incorporate in the resist a suitable coloring matter. For example, the back of the fabric may be padded or printed with a tannin color resist which contains substantive azo colors, and then

dried. The right side of the fabric is then printed or padded with tannin colors, dried, steamed and washed; in this way colored raised designs are obtained on a colored ground. The same effect can also be obtained by following Example 1 and incorporating a coloring matter with the thickened acetate of lime. In this case a black raised design is obtained on a colored ground.

Cotton Manufacturing in Turkey.

The Manchester Guardian states, "A change is taking place in the handloom cotton manufacturing industry of Turkey and the Balkan States which is likely to have consequences of considerable importance. The handicraft cloths hitherto produced have had a somewhat rough appearance, owing partly to the manner in which the warp is prepared for the loom, but still more because of the absence of facilities for "finishing" the cloth after it has been woven. Finishing machinery is now being sent out from this country, and already some of it is being used with very promising results. It is stated that the native cloth is much improved by the additional treatment, that the demand for it is expanding, and that this is one of the reasons for the recent considerable increase in the exports of yarn from this country to Turkey. Whether or not this new departure will appreciably lessen the consumption of English cotton cloth in the regions referred to remains to be seen. To some extent the improved native goods may displace imported cloth, but it is conceivable that the consumption of the former may be increased by the change in question without any serious reduction in that of the power-loom fabrics received from this country. In any case the prospect of continued large imports of yarn seems to be pretty well assured. As the Turkish law forbids the erection of tall chimneys without the special permission of the Government, we understand that oil engines are being sent out for the use of the new finishing works instead of steam engines.

Round Cotton Bale at Ghent.

The cotton industry at Ghent is of importance; there are 22 establishments, with 565,202 spinning spindles and 84,642 twisting spindles. The amount of cotton bought and sold in this city is therefore considerable, and the possibility of supplying this demand is worth the attention of American growers. As a matter of fact, cotton has in recent years been imported here in considerable quantities directly from the United States, some also arriving by way of Antwerp. Egyptian and Indian cotton, however, has always strongly competed with the American product. One of the causes retarding the development of American trade has been the great annoyance occasioned by the arrival of the bales in bad condition. Cotton spinners have for many years looked forward to some improvement in the method of packing cotton, which should insure its arrival in foreign markets in good condition. The invention of the round bale has therefore attracted much attention.

—The principle of the warp loom is descended from the hand warp frame, so that we may say that the warp loom is descended from hand frame. Of course there are no jack sinkers, as the threads make their own loop, a thread being given to each needle through a thread-guide. Most of the mechanisms on this loom are for moving the guide bar, or bars, from one to three bars being now used. The simplest work made on this machine is the ordinary Denby stitch, and one effect on the trade has been to use this stitch very much in such articles as scarves, shawls, clouds, and such like articles. The machines with more than one bar are used for making more complicated designs and articles. It has even been said that a warp loom can imitate anything from a sealskin jacket to a suit of clothes.

—In Norway the traditions of tapestry weaving have descended from mother to daughter since the days of the Vikings. In all the mountain farmhouses, of the present day, in Norway weaving is still carried on as part of the regular housework, and girls are employed to do nothing else. In the early days it was the work of the Vikings' wives and daughters to make large tapestries telling the story of the conquests made by their family heroes. These were hung in the great hall of every home, together with the war weapons of the husband and the sons, and the tapestries are said to have been very beautiful. Only vegetable dyes were used, and, while they lacked brilliancy, they made up for it in durability. A castle in Denmark contained a few of these rare specimens till a few years ago, when it was burned down. The weavers of Norwegian tapestries usually work out from memory any pattern desired. The main body is of some geometrical design, with a border of zigzag lines or blocks. Certain characteristics of these rugs and tapestries remind one of those made by the Navajo Indians. Is this due to the intercourse between Norway and America in the days before Columbus?

—Tailed yarn is an expression denoting yarn dark on one end. It is distinguished from striped or cloudy yarn where the light and dark places may be located all through the skein. After observation it has been noticed that this tailed yarn has nearly always been scoured the previous night, and that the men have not allowed the yarn to set on one end longer than the other. The trouble is traceable to yarn which is scoured, washed, and permitted to remain on the frames over night. It appears that the yarn gets a little heated in its wet end, and a condition best described as semi-felting is the result of the action which is set up. These dark places in the yarn are the thickened places where there was a greater surface and a greater body of color exposed to sight. The lesson to be learned from such an experience is to extract all yarn which has been scoured at night.

Wool Market.

The wool market for the last month has shown instances of greater activity than in previous months, and some exceptionally large sales have been consummated, due to the holders disposing of their stock at a shade lower than the ruling market price. There are several reasons why this was considered advisable on the part of sellers, as saving interest, cost of storage, and the indisposition to renew loans that are becoming due. There has been no general movement in this direction, simply reducing stocks in hand. Dealers have recognized the situation in which manufacturers are placed, and thought it more judicious to sell wool at less profit, rather than to hold it for an anticipated advance. That wool is a safe commodity to hold, is looked upon with considerable assurance, so long as the foreign markets show the strength that they do. X X Ohio and above is selling at 28 to 29 cents, the latter quotation more nearly representing the standard value. Michigan X and above is quoted at 22 to 23 cents. Staple wools are in a firm position. The wool receiving most attention has been the Territory selections. The feeling in the country seems to be towards lower prices, and wools that were recently held at 27 to 28 cents can now be bought at 25 cents, and Territory wools that have been held in the country on the basis of 45 cents clean can now be obtained for 42 cents, and even as low as 38 cents; still, these prices are looked upon as being extreme, to be afterward sold in the seaboard markets. The principal sensation within the last month has been the failure of the Wool Exchange, in New York, and the Tradesman's National Bank, that was closely identified with it. This ending of the exchange was anticipated at the time that it was started. It is impossible

under present conditions for any exchange of this kind to become profitable.

Our advices from Melbourne generally represent the Australian clip of wool as somewhat better than that of last year, the wool showing better growth, bolder, with more life and condition. Merino wools are said to be in light stock and will command full prices.

Cotton Market.

We quote middling uplands at present writing at 5⅝ cents, against 5 9-16 cents last month, showing a decline of 3-16 cents. The market outlook is not very cheering. Reports still continue, especially from Texas, in favor of an enormous yield, which will have a depressing effect upon prices. Frosts have now appeared in all sections of the South. The fact that the trade is obliged to handle two large crops in succession, has a demoralizing effect. In all instances where labor is to be hired, or land rent paid, the result of raising cotton this season must prove a loss to the planter, unless there is an improvement in price. Owners of land, fairly clear of incumberance, will be in a better position, of course, to stand the depression. Advices from Egypt show that the prospective crop there will be from six to six and a quarter million cantars. Much, however, depends upon the weather till the middle of this month. If favorable, the yield may exceed six and a quarter millions. The quality of the staple is perhaps a little better than that of last year. On the whole, the cotton crop is a favorable one.

In regard to the takings of American spinners, the Southern spinners have taken a larger quantity this season than last, up to the present time, while the Northern spinners have not taken much more than 80 per cent. of what they took last year.

—Few things have been adulterated to the same extent as wheaten flour, more especially that intended for sizing purposes.

—We are informed by those directly interested in the organization of the American Thread Co., which is to include a number of the largest cotton thread manufacturing establishments in this country, that the announcements that have appeared in the newspapers are premature, as the consolidation has not yet been formed, and, in consequence, there is no authentic information yet to be given out, as plenty of changes are liable to occur between now and the consummation of the project.

—The Hamilton Mfg. Co. and the Appleton Co., of Lowell, have petitioned the assessors for an abatement of taxes, claiming that excessive valuation has been placed on the property.

—It appears that the cotton spinning industry of Japan is producing more yarns and goods than it is capable of disposing of, and in order to regulate the production and maintain prices, a combination is said to be in progress for this purpose, which will take in all of the principal manufacturers.

—Japan has been forging ahead in the line of cotton spinning, and a recent report indicates that she is not to be behind in the fashion of trusts. Cotton spinners are threatened with over production, and are talking of a big consolidation which will include all the spinners in Japan with the view of regulating production and prices.

—Another inventor, by the name of Willis H. Kroner, 214 East Cross St., Baltimore, Md., has popped up with a claim that he has invented a new bullet-proof cloth, which he represents as soft and pliable, and a non-conductor of heat, no thicker, but heavier, than ordinary cloth. He says that he hit upon the process of making this cloth, and tested it with a 44-calibre Colt's revolver. The piece of cloth was hung on the wall, and of seven shots fired at it, all were deflected without visibly affecting the cloth. One bullet rebounded 12 feet and penetrated two inches into a wall.

COTTON DEPARTMENT.

Mechanism of a Fine Spinning Mule.

W. S. TAGGART.

(Continued from August.)

A good governor motion is of course an absolutely essential feature of a fine spinning mule, but it is a difficult matter to find one that really and successfully satisfies all requirements. The peculiar delicacy of the operation and the maintenance of a definite tension in the yarn cannot be trusted to the usual band governor motions, whose action is variable and far from positive. What is wanted is a motion capable of instant action without throwing any strain on the fuller rods, and one that is distinctly positive and without the slightest possibility of slippage or irregularity in its effect.

Fig. 16 illustrates an arrangement that embodies these requisites more than any other motion of which the writer is aware, and another great advantage is its remarkable simplicity.

Two lever arms or sectors "D and C" are keyed to the counter and copping fallers "A and B." A chain "F" is attached to each sector and a bowl "G" hangs pendant from it. To "G" is attached a drop weight "H" sliding in a guide bracket "J" bolted to the front of the square. To the lower end of

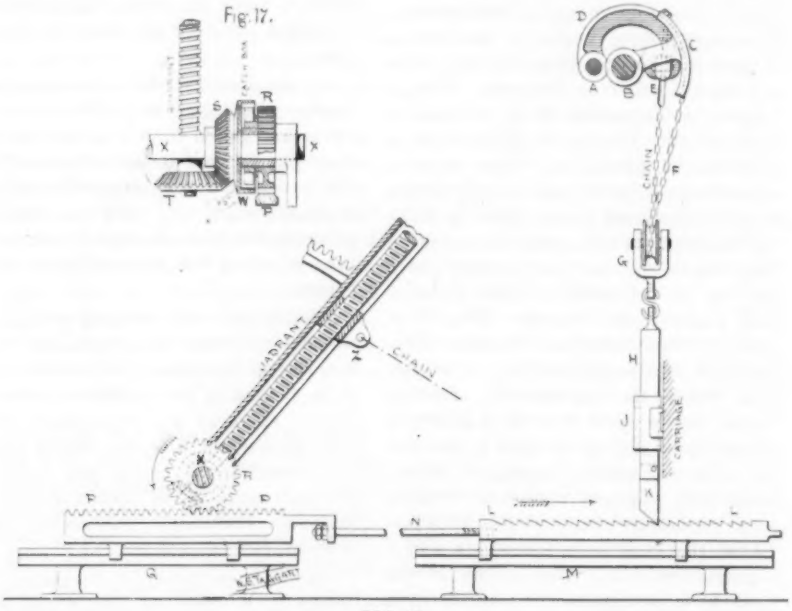


FIG. 16.

"H" is hinged a catch-piece "K" so arranged that when moving in the direction of the arrow, it forms one piece with the drop weight, but on its return it can slip over the teeth of the rack by moving aside on its pivot.

Underneath the drop weight "H" is a rack "L" so made as to slide upon a bracket "M" bolted to the floor. This rack is connected by the rod "N" to a rack "P" the teeth of which gear into the teeth of a wheel "R" mounted loosely upon the shaft round which

the quadrant ossilates; this rack "P" is also carried by a slide bracket "Q" bolted to the floor. The wheel "R" is arranged as shown in Fig. 17 so that by means of the catch-box "W" the quadrant screw is only acted upon as the carriage moves inwards.

Any variation in the tension of the yarn during winding, will cause the weight "H" to fall and its lower end "K" comes into contact with the teeth of the rack "LL" and takes it forward; the rack "P" follows the movement and turns the quadrant so that the nut "Z" rises up the screw. This at once increases the tension in the yarn and the weight is drawn up out of contact with "L," The carriage on its outward run comes, by means of a stop, against the rack "P" and moves the arrangement back again to its normal position. The rack "L" is made of a sufficient length to meet all requirements, and, as in some instances, the whole rack may be used to put the tension right, it may often happen that only a few of the latter teeth may be required to do this. An adjusting screw at "E" enables the motion to be carefully regulated.

As is well known, the backing-off arrangement of the mule is almost always actuated from the carriage at the headstock. Now, owing to the use of springs on the backing-off rod, or levers, the carriage experiences a resistance when it comes into contact with the projection or stop on the rod and is momentarily detained as a consequence, especially if the bands which take the carriage out are well used. The direct effect is to throw the carriage a little out of a straight line, stretching the yarn at the ends of the mule and producing irregular work. The importance of preventing this occurring has already been pointed out for fine work; arrangements are therefore adopted to relieve the carriage of the strain by transferring the operation to some other part of the mule.

Fig. 18 will serve to illustrate the

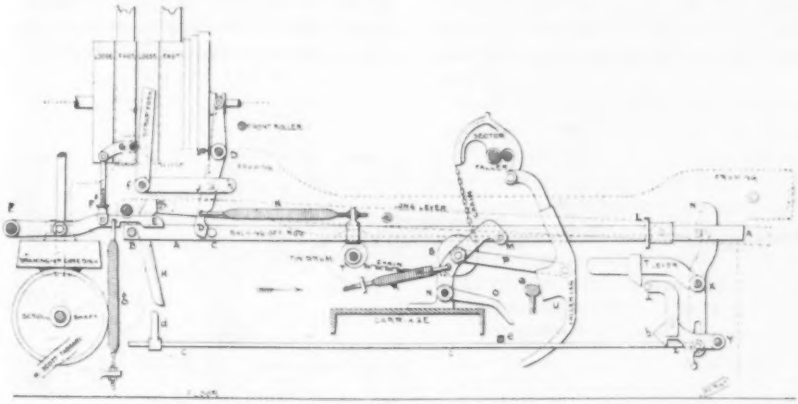


FIG. 18.

usual method of a well known English machinist for effecting the backing-off by the carriage. A lever centered at "N" on the carriage square carries a bowl "M" which is held rigidly through the link "P"" connecting the lever and the faller leg. The carriage in its forward movement brings the bowl "M" against the stop "L" on the backing-off rod "A" and forces this rod forward against the resistance of the spring "K" which, through the backing-off lever puts the backing-off wheel into gear.

Fig. 19 will now make apparent the means adopted in very fine spinning mules. A small cross shaft is driven from the rim shaft and this, through the bevel wheels "A, B, C and D," revolves a finger "E," which is arranged to come against the end "F" of a rod

"G" which runs the full length of the headstock side. This rod is forced forward by the finger "E" and a spring "H" is put into tension; on "G" is cut a recess at "J" which catches against a stud "K" on the backing-off rod "L." "L" is, therefore, also pushed forward and the time of the action is so arranged that just as the double speed is finished, the rod "L" pulls forward the backing-off lever "M" and causes the spindles to reverse. A spring "N" is put into tension through the forward movement of "L" so that directly the change occurs at the termination of the backing-off action the lever "P," fulcrumed at "Q," is lifted, and its other end "R" lifts the rod "G" and frees "L" from the catch "K" and permits the backing-off rod "L" to shoot back under the influence of the spring "N" and so takes the backing-off cone out of gear with the fast pulley on the rim shaft. This being done the carriage is drawn in and the cycle of operations just described again repeated. The bracket "T" is bolted to the headstock side, and studs "X and Y" in the two rods "G and L" coming against it prevent the rods going too far back under the force of the springs "H and N."

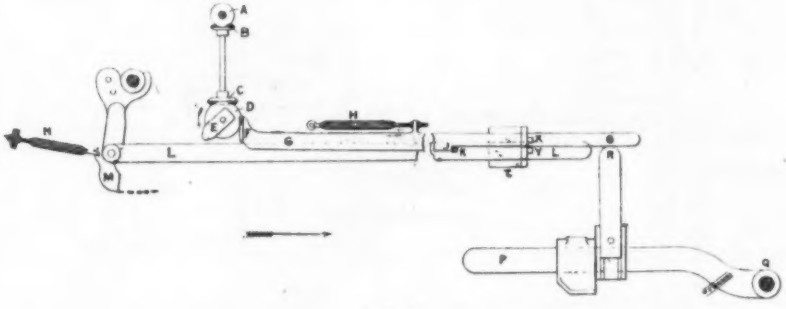


FIG. 19.

--Ancient cloth was woven in upright frames on which the threads of the warp were stretched, and the weft was put in by picking a place for it with a long needle, inserting a thread and pressing it down on the previous one with the needle.

Jacquard Lenoes.

In designing for jacquard lenoes if it is required to have a geometrical effect, we can put down that effect directly upon design paper, but if a floral effect is desired, it is absolutely necessary that a sketch be made first as though we were making a pattern for dress goods, to be woven on the ordinary brocade harness. The cloth that is produced on these jacquards is of necessity a light and open fabric on account of the manner in which the threads are interlaced and crossed with each other.

Take for example, a piece of plain gauze cloth where the ends are divided in pairs and it will be seen that one of the ends is perfectly stationary and always under the filling, while the other is continually moving, first to one side and then to the other, every pick thus making a firm open cloth. It will readily be seen that it is on account of these crossings that the cloth is made open and light, as it is impossible to beat up the filling close together.

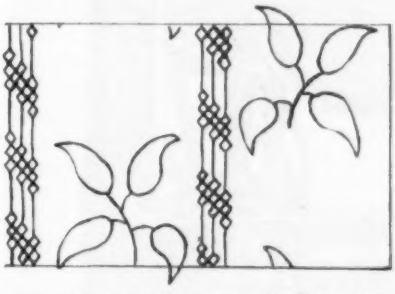
If such cloth was being made with a certain number of picks per inch and that number had to be increased; if the required number could not be put into the cloth with the order of crossing given, two or more picks could be put together as one and then a crossing made. The reason for this is obvious. The less crossings there are the more picks can be put in.

In the setting out of patterns for

these jacquards, it is advisable that they be as equally distributed as it is possible to get them, whether the pattern itself be made of gauze or the ground. We certainly get a better effect by having the figure so distributed, but this is not the only reason. The ends which form the crossings require a greater length of warp than the stationary ones at the time of crossing and as the ends are, for economical reasons, all taken from one way, it is necessary that the figures be so distributed; so that one part will counterbalance the other.

Any desired effect can be made that ingenuity can suggest, providing sufficient space be left between the figures to admit of the gauge being inserted.

A suggestion for one of these designs is given in an accompanying illustration, and it is intended that the figure, of which the outline only is given, shall be of gauze on a plain ground ornamented with a leno stripe. It will be seen that when the pattern is being formed in one stripe, the corresponding portion of the other stripe is making the ground work and vice versa, thereby securing an equal tension all through.



Taking the pattern given, we can readily see how other patterns can be formed from it, by a little alteration and variation. Instead of having a gauze figure on a plain ground, a plain figure could be made on a gauze ground. It may be that a fancy effect was required in the figure, such as a twill or satin, as in damask work, or a shaded effect may be introduced, in which case it is generally advisable to have a few ends and picks of plain round the figure so as to ensure proper separation of the threads.

Again an alteration could be made in the leno stripe; instead of having one stripe making leno while the other was making plain, and vice versa, and all going in one direction, the direction could be reversed; they could also be made to run in a zigzag form and so on, a number of patterns could be made, but it must be remembered that each change would require another design or part of one to be made.

A neat effect can be got if the pattern given were made in a jacquard with 256 figuring harnesses, having a 22/4 reed, 75's yarn, 3 ply, 24 for cord, 87's filling, ends two over two, 88 or 90 picks per inch.

Three rows or 24 harnesses will be required for each leno stripe so that there will be 104 ends for each gauze stripe which on the reed given will make rather over one inch of cloth per stripe. The same pattern could also be made on a 400 machine which would give a wider stripe having 176 ends for each, but if a finer reed were used a firmer effect would be secured.

THOMAS.

—During the Victorian Era, very startling and marvelous inventions have been introduced, and in no branch of manufacture have greater strides been taken, than in the manufacture of hosiery. From the old 1 at once hand frame, to the 36 at once automatic fashioning Cotton's patent; from the loop-wheel circular, to the latest American automatics; from the hand seaming, to the fast seaming machines of German construction; and from the hand winding wheel to the fast, regular, winding machines, we can trace these great developments.

—The pulling and steeping of flax were depicted on the Egyptian walls, and showed the process to be much the same as at the present time.

—More failure can be attributed to overbuying than to any other one cause.

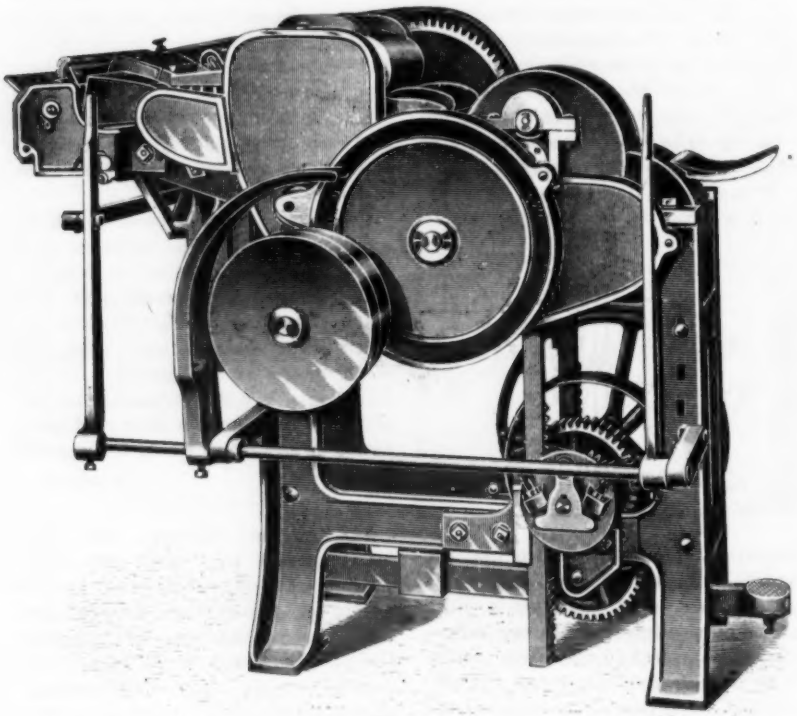
Cotton Combing.

Cotton combing is, as the word implies, the combing out or the extraction of the short fibres, neps, dirt, etc., in order that we can get the very best fibres calculated to give the strongest and best results. It involves the removal of all fibres that do not come approximately to a required length of staple, and it can readily be seen that Gallini, varying in length of staple from 1 1-4 to 2 inches, are what we must consider.

The series of machines used in the combing process are

1. Drawing frame.
2. Sliver lap machine.
3. Ribbon lap machine
4. Comber.
5. 3 or 4 drawing frames.

After the cotton has been carded it



SLIVER LAP MACHINE

yarns, in which all the fibres are of nearly the same length, must be exceptionally strong and even.

Combed yarns are used in sewing and machine threads, hosiery, lace curtains, loom harnesses, imitation silks and all fine cotton fabrics.

The combing of short stapled cottons has not as yet been successfully performed, although this is a matter of opinion, but the long stapled cottons, as Sea Island, Florida Sea Island, Peeler brown Egyptian, and is generally drawn once to straighten and parallelize the fibres, thus relieving the sliver and ribbon lap machines, as the condition of the sliver helps to a great extent the work of these machines.

The first of the series in this process is the sliver lap machine, the object of which is to unite a number of slivers into the form of a sheet preparatory to the ribbon lap machine or comber. Fourteen or sixteen ends or slivers are placed behind the ma-

chine and passed through guides over stop motion spoons to a "draw box" of three sets of rollers. Here they are drawn and carried forward between two pairs of heavy calender rollers in the form of a sheet and wound onto a wooden bobbin which revolves between two iron plates. These plates turn with the bobbin, thus keeping the edges of the lap uniform. The lap varies in width from 7½ to 10 inches according to the number of ends put up.

The lap is kept tight by a brake or friction pulley, on each end of which is a pinion working in a rack connected to the bobbin plates. The firmness of the lap can be regulated by the weight on the lever which keeps the strap tight. When the lap has reached its proper size a dog on one of the racks comes in contact with the stop motion arm thus stopping the machine. The operative then releases the friction, raising the lap, and draws out the bobbin shaft and removes the lap. Care must be taken to get the bobbins level on each end and to have them fit accurately between the bobbin plates, otherwise a bad selvage will be the result causing "licking" on the comber. Cut slivers and thin places in the lap are made by carelessness in cleaning, oiling and varnishing the leather rollers, and in the working of the spoons.

A small draft, usually from 2 to 3, is used on the sliver lap machine, chiefly to keep the ends tight and straight and to assist in laying the fibres parallel.

To find draft: One yard of sliver at the back weighs 40 grains, and 16 ends are put up together.

One yard of lap at the front of the machine weighs 275 grains.

40 × 16 = weight of one yard in grains at back = 640.

275 = weight of one yard in grains at front = 275.

640 ÷ 275 = 2.32 draft.

By figuring the gears we get the same: back roll = 1½ inches diameter; front roll = 1½ inches diameter; gear on front roll, 22 teeth; intermediate gear, driven by front roll gear, 40 teeth; intermediate gear, driving back roll gear, 40 teeth; gear on back roll, 51 teeth.

(1½ × 40 × 51) ÷ (1½ × 22 × 40) = 2.31 draft.

To find the production we must first find the revolutions of the 5-inch calender rolls.

Revolutions of frame shaft, 130; pinion on frame shaft, 29 teeth; gear on the 5-inch calender rolls, 72 teeth.

(130 × 29) ÷ 72 = 52.3 revolutions of 5-inch calender roll.

Rule for Production: The product of the revolutions of calender roll × circumference of calender roll, in inches, × grains per yard, × minutes run, divided by the product of 36 (inches in yd.) × 7000 (grains in lb.)

(52.3 × 15.7 × 275 × 600) ÷ (36 × 7000) = 537.63 pounds.

Less 10 per cent. for time stopped: 537.63 — 53.76 = 483.87 pounds production for 10 hours.

PRODUCTION TABLE FROM ACTUAL TEST IN MILL.

Kind of Cotton Used.	Lap.	Revolutions of Calender	58 hours less 10 per cent.
American Peeler . .	275	65	3300
Brown Egyptian . .	280	"	3250
Gallini	250	"	3000
Florida Sea Island .	230	"	2800
Sea Island	190	"	1800
Peeler and Egyptian .	275	"	3200

Like all production tables, it varies from the rule given because of the breaks, activity of the operatives and other minor reasons familiar in all machines. The horse power required in running the sliver lap machine is from 1/3 to ½ horse power.

COMBER.

—The flax plant is a very graceful annual, rising on a single stalk to a height of from 20 to 40 inches; and branching at the top has a head of pretty blue flowers.

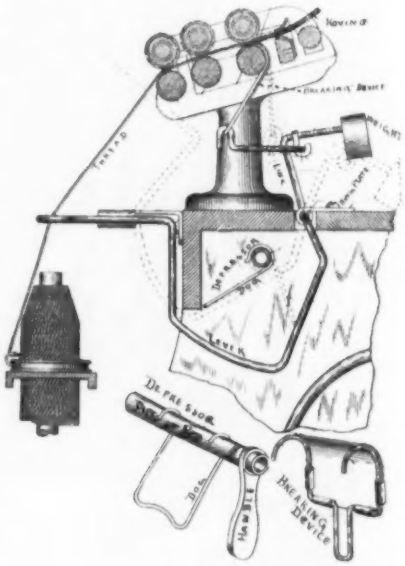
—A pure vicuna wool, which is very costly and little of it grown, was the origin of the vicuna cloth.

Spinning Frame Device.

We illustrate, herewith, a device which can be attached to a spinning frame, in the production, more especially, of coarse cotton yarns. We have submitted the idea, or principle, contained in this device, to some of the best experts in frame spinning, and it has been, without exception, most favorably commented upon, for coarse numbers. The inventor, Henry D. Martin, now connected with the Tennessee Manufacturing Co., Nashville, Tenn., is well known among cotton machinery builders, and is regarded as a man of genius in his particular line.

In order to prevent waste and to save in the labor of attendance, several different forms of apparatus have been devised for breaking the strands of roving on a spinning-frame, each spindle of the frame having provided for it a clamp which shall break the roving supplied to it whenever the thread made from the roving shall have become broken and cease to wind upon the spindle. The breaking of the roving causes it to cease being fed forward by the drawing-rolls, and thus prevents the waste which would have been made between the time of the breaking of the thread and the time of discovery thereof and the piecing up of the end by the operator. It also saves the time which the operator would have spent in removing the waste from the clearer-roll or other place where it might have accumulated. The usual device is controlled by a pivoted thread-guide placed between the drawing-rolls and the spindle, and the breaking of a thread releases the pivoted guide, which being then moved by an overbalancing-weight brings into operation a clamp which holds the roving at a point before its entrance into the drawing-rolls and causes it to be pulled apart or broken by the pull exerted by the revolving rolls.

Although many breakers have been designed, there have been inconveniences attending their use which have in a measure overcome their advantages and have prevented their general adoption. In the spinning of the coarser numbers of yarn there is a considerable advantage in the use of these appliances, the great saving in waste being more than sufficient to pay a fair return on the cost of their adoption. In the spinning of the finer numbers however, the smaller saving in waste is not alone sufficient to compensate for the additional cost of installation and to overcome the disadvantage caused by the gathering-places for lint and flyings offered by the extra parts introduced in the construction. Moreover, the saving in



time occasioned by not having waste to remove from the clearer-roll is partly lost because of extra time required to insert the broken end of roving into the guide-trumpet and between the first pair of drawing-rolls when an end is to be pieced up. Attempts have been made to overcome this need of feeding the roving forward by the operator, by making the action automatic and causing the roving to move forward between the drawing-rolls by the simple operation of depressing the thread-guide.

The object of the present device is to provide a roving-breaker which shall be perfectly certain to break the rov-

ing whenever the thread-guide is elevated by the overbalancing-weight and equally sure to automatically feed it forward when the thread-guide is depressed.

The principle feature of the invention is a roving-breaking-roll-lifting tongue or shield which is operated by the pivoted thread-guide and which when the spindle is successfully operating and spinning the roving into thread is held clear of the rolls and roving and inoperative. When, however, the breaking of a thread releases its thread-guide, an overbalancing weight causes the thread-guide to fly up, and this movement projects the tongue or shield into a position between the first pair of drawing-rolls, clamping the roving between itself and one of the rolls and permitting the next pair of rolls to pull apart or break the roving between the two pairs of rolls. The end of the roving and the driven roll are both kept clear of the driving-roll by the tongue or shield, so that no injury comes to either of them, and as the roving loosely fits the guide-trumpet which traverses behind the rolls there is no tendency to withdraw the roving from between the rolls, and it remains for any length of time uninjured and in place ready to be caught in the bite of the rolls and fed forward the moment the tongue or shield is withdrawn by the act of depressing the thread-guide lever, which is done by the operator when ready to piece up.

The depressor consists of a pipe or rod, turning in brackets or in holes bored through the standards of the frame, upon which are mounted a series of dogs. These dogs may be made of stiff wire and held in position upon the rod by the spring of the wire, or may be of any suitable shape and attached in any suitable manner. The dogs are usually in the position represented in full lines, but after doffing—that is, when the full bobbins have been removed from the spindles and empty ones substituted, the thread-guide levers being then, both for convenience in handling the bobbins and because of the absence of tension upon the threads, in the elevated position shown in dotted outlines—it is desirable to depress them or return them into the position for spinning, as shown in full lines. The handle is therefore turned by the operator, thus bringing all the dogs into bearing upon the thread-guide levers and depressing them from their elevated position (shown in the dotted lines) to their normal position (shown in the full lines.) The dogs are then in the position shown by the dotted lines before starting up the frame. As soon as the frame has reached its normal speed and tension upon the threads has become established the handle is returned to its normal position, thus removing the dogs from bearing upon the levers and leaving them free to operate in case of the breakage of a thread.

It will be seen that the tendency of the pressure exerted by the dogs in depressing the thread-guide levers is to make them bind more closely upon the rod which carries them, so that they are not in danger of accidental displacement upon it, although they may be easily sprung upon the rod and are also capable of ready adjustment lengthwise the rod.

Figured Fabric.

We illustrate, herewith, an ingenious invention of an English designer, relating to the manufacture of an improved woven figured fabric produced without the use of doup healds, and having a spider or embroidery effect on the face of the fabric, with a smooth and firm back on the reverse side of the figure. In similar fabrics having figures produced with the use of doup healds by the well-known leno motion, the reverse of the leno leaves an open and ragged back on the fabric, due to the crossing of the warp threads. In the accompanying drawings, Fig. 1 represents how the ends forming the pattern are drawn into the healds; Fig. 2 represents the pegging plan to form the pattern; and Fig. 3 repre-

sents the interweaving of warp and weft as arranged in Figs. 1 and 2.

In Fig. 1 the letters "A, B, C, D, E, F, G, H," designate the heald staves, and the numerals "1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 and 16" denote the ordinary ground warp threads, and "34 and 35" the threads of the extra warp which forms the figure. In Fig. 2 the numerals "17, 18,

FIG 1

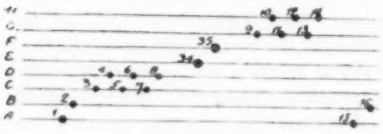



FIG. 2

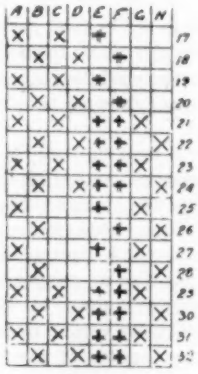


FIG. 3

19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32" denote the picks of weft required to complete the figured fabric. The single crosses in Fig. 2 denote those ends of the ground warp which are lifted over the picks of weft and the blank spaces represent those ends of the ground warp which are depressed and are under the picks of weft. The crosses made with double lines represent the extra warp used to form the figure producing the spider or embroidery effect. The warp ends "1, 2, 15 and 16" are drawn in on the heald staves, "A" and "B," and form the groundwork of the cloth. The warp ends "3, 4, 5, 6, 7, and 8," are drawn in on the heald staves "C" and "D," and the warp ends "9, 10, 11, 12, 13, and 14," are drawn in on the heald staves "G" and "H." The warp ends "34" and "35" of the extra warp used to form the embroidery effects are drawn in on the heald staves "E" and "F." The warp ends drawn in on "A" and "B" may be varied or added to as desired to form any required pattern or design. The ground of the fabric may be plain, twill, or other weave as desired, and any suitable number of heald staves may be employed to weave the figured fabric.

English Charges on Cotton.

It may be of some interest to many of our readers to know of some of the charges that are placed on cotton at the port of Manchester, England. We give the following upon the authority of a Manchester local publication, devoted exclusively to cotton, all of the charges being on the basis of so much per bale. Receiving, weighing, sorting to marks, stowing on the quay, and loading off to cart, rail, or barge alongside, eight cents. Ordinary sampling on quay, including the making up and delivery to any office or railway station, one-half cent. Conveyance from quay to warehouse, piling, and re-delivery to cart, 12½ cents. First sampling in warehouse, mending rough bales, delivery to scale and weighing, 11 cents. Delivery from scale to cart or rail, including sampling upon delivery, and ordinary marking, 3 cents. Storage per week, after three days from day of landing, 1½ cents.

—The usual process in Ireland is to pull the flax before it is quite ripe, when the stalk has become yellow about two-thirds of the way up, and when the seeds are first beginning to turn brown.

WOOLEN DEPARTMENT.

Ingenuity in Modern Textiles.

ARTICLE III.

CHARLES E. WILES.

(Copyright.)

Woolen Suitings and Trouserings:—The class of goods detailed for consideration under this heading may be said to occupy one of the highest positions in point of importance in the whole textile trade, and there are many features in connection with the same which support and justify such eminence being allotted to it; but at the same time it will be found that however numerous the points of merit observable about the better classes of these woolens may be, a certain dearth of novelty is everywhere present and those elements which provide the attraction are as a rule entirely the result of slight but continued improvement and modification effected upon styles which have appeared previously, the origin of such styles dating back in many cases almost to the earliest years of the trade.

Little concern need be felt on account of this lack of newness, because it is easily understood that fabrics intended for the specific purpose mentioned above do not provide a desirable medium for the exhibition of sudden and conspicuous novelty, although the slight changes which are occasionally introduced, more with the intention of obviating monotony than for any other motive, are generally worthy of commendation, and should therefore be welcomed. Consequently whatever ingenuity is displayed in the manufacture of these cloths, it must be necessarily confined within much narrower limits than is the case with many other styles, and the sole energies should centre themselves upon the production of such textures as shall form a satisfactory blending of the two desiderata "use and beauty."

For of all threads employed for textile purposes, the woolen is essentially a useful one and properly manipulated will yield one of the best of cloths, but as it leaves the hands of the spinner it is the possessor of certain peculiarities of structure which are so invariable as to entitle them to be termed characteristic features and which must be attentively regarded by designer and manufacturer alike for profitable working. Chief among these characteristics is the excessive roughness inseparable from the thread, the individual fibers appearing to stand out in all directions as from a central core. Such a production cannot with accuracy be termed a "neat" thread and consequently is not suitable for fabrics requiring a clean thready surface. Comparison with worsted yarns and textures will illustrate plainly enough the direction in which difference lies. Instead, therefore, of attempting the production of smart, clear effects with woolen yarns, more profitable results will accrue from studying their special characteristics, basing the preliminary methods of procedure upon them, and following them up in such fashion as shall make these features contribute to, rather than detract from, the finished article.

This, then furnishes a highly important reason for the appearance of sundry elaborate color schemes which are to be seen in standard suitings of wool, whilst the crossings or weaves remain of the simplest nature. For the fibrous surface of these textures is an ideal one for the exhibition of soft, pleasing and harmonious effects in color, and it follows naturally that there is little to be gained by utilizing intricate crossings whose beauties would be entirely obliterated during

the finishing operations. But there is another and a stronger claim favoring the employment of these simple weaves;—they are at the very foundation of an interesting and far-reaching system, a system to which careful study must be given, since a thorough knowledge is essential when designing effective styles for the suiting and trousering trade. It is that system which treats of the relation and combination of weave and color and whose most elementary example is found in what is termed the "plain hair line stripe." Right along through all the standard crossings this principle extends and the results obtained by judicious and ingenious arrangements of colored yarns in combination with appropriate weaves occupy a very large section in a typical pattern-book.

It is impracticable, however, to enter here upon an analysis of such methods with anything approaching completeness, but standard examples of a few of them will be found among the accompanying designs, those illustrative of styles which have lately received favor.

A considerable proportion of these cloths is quite solid in coloring, and where this is the case, precedence is given just now to the darker shades of brown, and following these are mixtures of browns and greens, sometimes the one, and sometimes the other of the colors predominating, crimson being also introduced with satisfactory effect into blends of the foregoing. Grays and slates appear next in prominence being often darkened in tone by the admixture of browns, black, greens and blues. An examination of some hundreds of samples has furnished the order of popularity. Allotted to these colorings, and one or another of the above mentioned shades will be found in at least ninety per cent. of the standard cloths at present on the market.

Mention may next be made of the means employed for relieving the tendency to monotony often apparent in solid colorings and in the generality of cases these consist of arrangements of over-checking, by means of which skeleton checks of widely varying sizes, colors and yarns are introduced. Such checks are seldom more than one or two threads in thickness and their color should be such as will form a pleasing contrast with the ground on which they appear, making checkings from one-half to three or four inches in size. In some cases fancy twist yarns are substituted for the ordinary colored ones and when these are thoughtfully selected, they give an additional piquancy to the pattern.

No style is simpler, from the point of actual construction, than the highly popular tweed; and although this be the case, cloths of this description have obtained a hold upon the market which it would be difficult to excel. The crossing illustrated in Design 1, is a representative one for tweed goods, and consists of the four shaft twill, two up, two down in angled draft. Modifications could easily be prepared from this by varying the number of threads to each angled portion. The warp coloring being solid and the weft likewise, only of a different shade, it is easy to preconceive what the effect will be of employing any simple weave, and indeed none but crossings of a very elementary character are introduced into such makes, what variety there is noticeable being generally due to the arrangement of such weaves in appropriate combinations and also to such modifications of them as results from a sensible rearrangement of their threads or picks. The features mainly responsible for a successful output in this department are correct setting of the cloth in the loom and a careful finish; these two factors in combination giving that full, rich and soft handle which is so much sought after. Suitable weaving particulars for Design 1 are as follows:

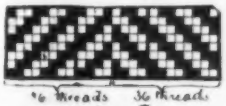
Warp 22 skeins cheviot yarns, light drab shade, 18s reed 2s.

Weft 22 skeins cheviot yarns, tan brown shade, 36 threads and picks per inch.

This cloth could be improved by the addition of a scarlet and black twist

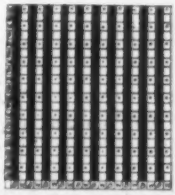
overcheck, the longitudinal portions of which might run up the centre of each alternate stripe of twill, the crossing threads being put in according to the desired length of the check. In the shades and contrasts should receive close attention and study.

Reference must now be made to that class of textures in which the weave of the cloth becomes responsible for



Design I

Sketch 2



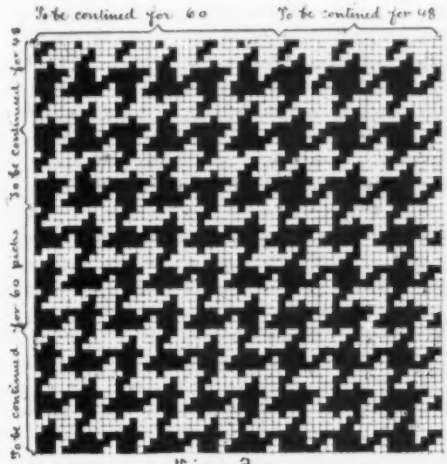
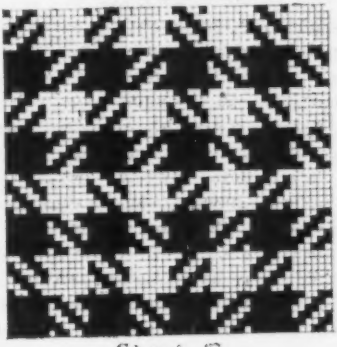
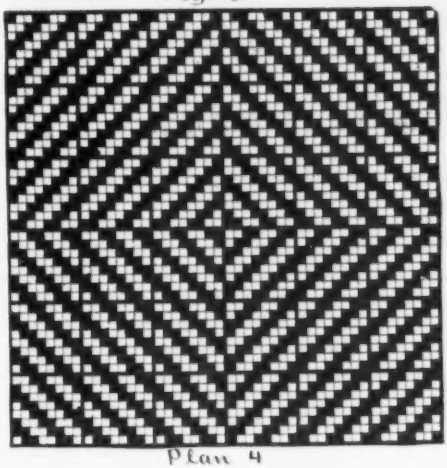


Fig. 3


Sketch 5


Plan 4

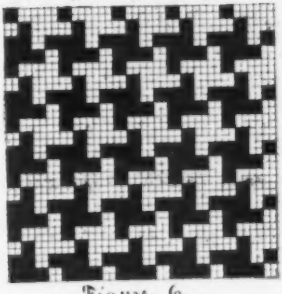
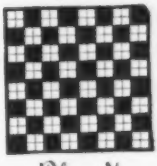


Figure 6


Plan 7

manufacture of these goods it must not be forgotten that the item which first strikes the observer and possible buyer, is that of color, and consequently the preparation of pleasing certain colored effects exhibited upon it. As has previously been stated, the most elementary example of weave and color working in conjunction is furnished by what is termed the single

thread hair line stripe, produced in the plain crossing and of which illustration is afforded in sketch 2. The position of the colors in relation to the weave is given alongside the sketch, and from this it will be seen how to obtain some idea of the appearance produced by certain combinations before they are actually put into the loom.

Figure 3 is given for the purpose of illustrating one of the many saleable effects obtainable by an appropriate arrangement of colored threads in the common four-shaft twill, two up, two down. The warp for this has been arranged as follows:

3 threads dark gray shade, 3 threads light gray shade for 60 threads.

4 threads dark gray shade, 4 threads light gray shade for 48 threads.

Weft same as warp.

A sound cloth would result from using 24 skeins warp and weft, the former in an eleven's reed, four ends in a dent, and the latter being inserted 44 picks to the inch. In this example, the same crossing is employed throughout, the order of the threads being altered to enhance the pattern, but it frequently occurs that a constant system of coloring, say two dark, two light, or two dark, one light, or three dark, three light, etc., will be maintained throughout and in such cases the weaves may be so arranged as to cause the colors to assume check, stripe and broken effects.

Plan 4, is a simple check formed in the cassimere twill by reversing, and by adopting a six and six order of threads all through, it makes an effect in the cloth similar to that shown in Sketch 5.

Particulars for weaving Plan 4:

Warp: 6 threads, 24 skeins wool, russet brown shade; 6 threads, 24 skeins wool, white (tinted); 12s reed 4s.

Weft: Same as warp.

48 threads and picks per inch.

This cloth may be finished with a clearer surface than the one in the preceding example, as a tolerable amount of fibre on the face is desirable in that woven like Fig. 3, to soften the appearance of loudness and harshness which invariably threatens so large a check.

All the best known crossings, as for instance, the cassimere and prunelle twills, the six and eight leaf twills, four, six and eight heald hopsacks, swansdown, mayo and corkscrew makes are drawn upon and utilized in similar fashion, according to the style of pattern desired, but a perfect knowledge of the possibilities of even these few is only to be acquired by experience, which, as often as not is the outcome of experiment. There is, however, always a representative assortment of such productions on the market, and they will generally repay study, although an examination of present patterns reveals comparatively few novelties in the direction of color arrangement, except in the very highest grades of goods.

The next illustration, Fig 6, is one of a style frequently seen and is woven from the ordinary four-shaft mat weave shown in Plan 7, in combination with a system of coloring arranged in fours; the size of the pattern being, of course, in direct proportion to the thickness of the yarns composing it.

Suitable weaving particulars for making this would be:

Warp: 4 threads, 20 skeins wool, dark slate shade; 4 threads, 20 skeins wool, black; 12s reed 4s.

Weft: Same as warp.

40 picks per inch.

This pattern, as well as those preceding it, is considerably improved by the addition of a suitable overchecking and a desirable size for such in this case would be about an inch in width by one and a quarter inches in length.

In the next article there will be a demonstration showing the diversity of patterns which may accrue from one weave, either by different arrangements of colored yarns, or by the same arrangement of threads with only a slightly altered position of the weave in relation to them.

—Business cannot be learned from books nor acquired at school.

Flocks.

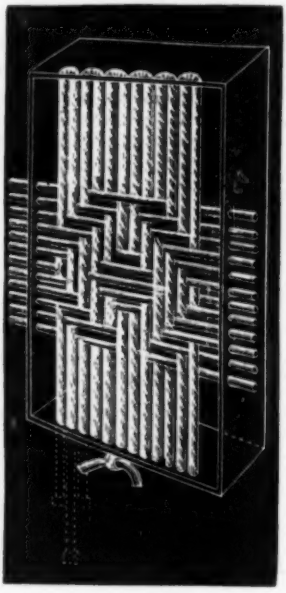
The fact that flocks need not be a detriment to woolen goods, although well recognized by those in a position to know, is not accepted by the general buying public. We cannot help but admit that in many instances this aversion of the public is well founded, for on the lower grade of goods, flocks are in most cases a decided detriment to the goods. The reason for this detriment may in each instance be easily pointed out, but at the time of pointing out such cases the goods in question are certainly past redemption. The subject of flocks and flocking should therefore receive careful attention, not alone from the finisher, but also from those who often control the finishers' actions in this respect. The question naturally arises, why is it that flocked goods are mostly objected to? We find the answer in every case to be, that it is principally on account of the tendency of the flocks to drop out and gather in the lining. So far as the finisher is concerned most of the blame is generally put on his shoulder, and while there may be instances where the manner of putting on the flocks has considerable to do with their staying capacity, it is more than likely that the powers furnishing the finisher the flocks to use is more to blame than he. If poor flocks are furnished simply on account of their cheapness fault should not be found with the finisher if the goods turn out to be cheap decidedly. The poorer the flocks which are used, the more will have to be used in order to reach the final results aimed at, i.e., making up of weight, and it does not matter how the thing is figured out in the end it will be found that the cheap flock is generally the dearest. In the first place, there is more waste and from 50 to 75 per cent. more flocks will have to be used to arrive at given results than would be required of a good quality of flock. Besides all this the looks and general appearance of the goods will suffer considerable with the cheaper flock, for it is next to impossible to keep flocks from the face of the goods, no matter how good they are tacked, if from three to four times the amount needed to make weight has to be put on the goods in order to have enough stay on to have them come up to weight. However a cheap flock is not always a poor one, and we often find a lot which is quite a bargain as to quality. In many instances, in fact, in most instances, the goods have as much to do with the flocking as the flocks themselves. If goods are largely composed of shoddy and other inferior stock, it is folly to think that flocks will adhere and felt in as readily to this as to a fabric composed of good clear stock. So we find that in order to be successful this item must be taken into consideration and the flocking conducted accordingly. If we should put on the same amount on this latter class of goods as we do on cotton warp goods, the goods would come out stiff and boardy and entirely too heavy; in fact, would not be considered as fit to use. The unimpaired wool fibre will hold many particles of flocks and this taken together with the felting capacity which should be in the flock itself will show plainly that a different mode of treatment is necessary here. The worst practice the finisher has to contend with, is the habit of manufacturers to provide a good quality of flocks for an all-wool fabric, and as the goods made are cheaper so also the grade of flocks supplied grows cheaper, which to our mind is exactly opposite from what ought to be. All-wool goods, that is to say, wool not the shoddy all-wool kind, have all the felting capacity there is in the fibre and therefore are able to absorb and hold a poorer flock than is usually put on, and give excellent results. Of course we do not mean to say that a flock which is so poor as not to have any felty capacity in itself should be used, for this kind we hold to be unfit for use on any kind of goods. Having tried and experimented on this line quite a little we have come to the conclusion that a medium quality flock is the thing for a good fabric. In considering cotton warp goods a different state of things confronts us, however. As these so-called union cassimeres are generally woven the same weight

the year round and the heavy weights are mostly produced by the use of flocks it is readily seen that quite an amount is likely to be needed. Flocks being applied to the back of the goods we naturally look first at what we have here to felt a flock to, and find that we have practically nothing of a nature to help us. We find nothing but the cotton threads with here and there a little of the filling exposed and most of the time this also is of very questionable quality, and to try and put a poor grade of flock on such material, is sure to result in failure. To be sure we may be able to paste enough of them on to have them come to weight, but how long will they stay on is the question. Certainly as soon as the goods are handled they will begin to drop out and this will not stop till all has dropped out as the goods are worn. But the great thing sought after it seems is to get the goods out of the mill with enough flocks in them to have them up to weight no matter what happens afterward. Here is the place to employ a good quality of flock and the goods will be so much better for the use of them that the reputation of the firm will be enhanced and in the end if things are figured close, there will not be such a great difference in the cost. This leads us to the consideration of the problem of good and bad flocks. Now it is a very hard matter to determine the value of flocks until after they are used, for even if the flocks are made of good stock the chances are that they have been spoiled at the cutting or rather the grinding, as it should be called. The value of a shear-flock which is recognized as the best quality, is due to the very reason of their being cut by sharp knives and not ground, thus retaining all their felty capacity intact even if the fibre is shortened. The grinding process of the average flock cutting machine is detrimental to the felting property of the wool fibre and therefore too much care cannot be bestowed upon this machinery. Flock-cutting machines should be kept as sharp as possible, and by reversing frequently and paying due attention that no foreign matter gets to the knives with the stock, it will be easy to keep them in good condition. The best of stock is easily spoiled on dull machines and the trouble will show itself after the goods are finished when it is too late to remedy the matter.

REAUMUR.

A Designing Device.

We illustrate a mechanical designing device, invented by a weaving-mill manager in England, which is represented as greatly facilitating designing as compared with the use of point paper, as it readily admits



of an almost endless experimental variation of the interlacement of the threads, which are being dealt with. It also has the advantage of showing the effect of the design on the two sides of the cloth, which will be recognized as oftentimes presenting features of considerable value in the production of effects arranged in reverse order. This mechanical frame has a particular advantage to teachers and learners in designing, as the design can be more clearly comprehended than it is pos-

sible, in the use of point paper. When the latter is employed, the effect of the design in a fabric must be left largely to the imagination, and it is oftentimes difficult for a student to see forms in his imagination, in the transformation of the vertical and horizontal lines, as shown on point paper, into the woven fabric, showing the relative arrangement of the warp and weft threads. There are machines, or small designing frames, fitted with tapes, which can be interwoven and made to form small designs. These have the disadvantage, however, of showing the design in flat effects, instead of the round, more in harmony with those produced by ordinary yarns.

The accompanying illustration shows a sketch of the frame. It may be of any four-sided shape or size. The one shown here is a small oblong one. The sides are formed of a strip of brass sheeting bent to the shape required, and soldered at the junction. Along the margins of the edges are a number of small perforations large enough to receive woolen, worsted, or coarse cotton yarns in the manner shown in the vertical threads of the illustration. These form the warp threads upon which the designer operates. The weft threads are represented by a number of brass pins, which are inserted in the side of the frame and passed under and over the warp threads in the manner desired to form the design being thought of. The figure is then seen as in the example given. By turning the frame round, the reverse is brought into view. The actual rise and fall of the healds is thus at once exhibited. A duplicate may be taken from any sample of cloth by means of the pattern frame, which actually demonstrates the method of interlacing the warp and weft threads corresponding to the rise and fall of the healds to produce the same effect in the loom. Any number of patterns may be tested by means of the pattern frame in a very short time without expense, which if carried out in the loom would require a great amount of time, material, and labor. This in the aggregate would mean a great cost. To straighten all the ends in the pattern frame after finishing, turn the ends of the pins sharply between finger and thumb, and the threads will soon be brought together and give the best effect.

Woolen Manufactures.

For a wide range of goods, plain and fancy, and embracing light and heavy fabrics, as well as fine and low qualities, the Huddersfield System is one of the best in the world. Its immense scope enables a manufacturer to turn from one extreme to the other at short notice, and to meet the changes in style or fashion without difficulty. Being based throughout on a fancy trade, the machinery and system are also available for plain goods, a statement we cannot apply to those based on plain goods only.

Carding.—Being mainly calculated and arranged for a "mixed trade," where good carding and even yarn are of the first importance, the extremes of width in the machines have been avoided. A shake willey is the first machine for getting rid of the dust and opening the wool and other materials in a moderate way, preparatory to mixing the blends. This machine is sparsely set with strong spikes, and runs at a moderate speed only, in order not to break the fibres. Woolburring is the next process for wool, which should first receive its quantum of lubricating oil as a preventive to breakage of staple. When dry wool is put through the burring machine without oil, it is surprising how much shorter and broken it becomes than when previously oiled. In addition to the output, the wool is infinitely better prepared for the cards and saves much strain upon the wire, enabling the cards in their turn to do their work better and more of it in the same time. If the wool is intended for mixing in a blend with mungo, waste, or cotton, these various materials are spread in layers on a floor, each layer

(except the cotton) receiving its share of lubricating oil. Cotton is better without oil, and any it receives should only be that from its inevitable contact with the blends. The blends should now be well mixed together and passed once more through the shake willey.

For its thorough mixing and preparation for the cards it has now to pass through a teaser, a machine of one cylinder with three or four rollers and one doffer, all set with "cock-heel" spikes about one inch apart. This is an indispensable machine in the efficient mixing of woolen blends, as well as to good preparation for the delicate wire of the cards.

The wool is now ready for the "scribbler." For all-round work, where fine, medium, and low qualities have to be dealt with in frequent succession, this machine or scribbler appears to answer all requirements of the tweed and fancy trade; and these goods from the Huddersfield district are certainly unrivalled, and often pass as pure Scotch.

The manufacturers' season in cloth for men's wear is always twelve months in advance of the retail season, especially in the high-class goods which lead the styles. The designer has consequently no light task in hand, as his work has to be done earlier still, and his novelties ready in advance. Those for the spring season 1899 (next year) have been already placed upon the market, and some indication may now be formed of the class of styles now in favor.

Worsted vicunas have clearly displaced the bright and clear finished coatings for the present, and also the old-fashioned meltons. Although they have the same class of finish as a melton, they are much more flexible in the handle and drape better, as the fulling does not become so firm as an all-wool cloth. Some are made with worsted warp and woolen weft, and others of worsted with a woolen back, but the flexibility remains in all three so long as a worsted warp is employed. It took some time to bring these cloths into fashion, but they now lead the way and have obtained a hold upon the market which overshadows all others. Some manufacturers complain that they can be easily imitated with cotton warps and shoddy weft. This is quite true, but the makers of the all-wool goods have nothing to fear from cotton warps, as they will not drape the same. They also retain the creases when crushed, and in various ways betray their inferiority in the wearing of them.

Cotton warp vicunas, then, are only a slop clothier's cloth, and the consumption is very large, having almost displaced low worsted coatings. The prices vary from one shilling to two shillings per yard, 54 inches wide, the latter being remarkably nice goods, both in appearance and price. They suit the million, but a better class tailor dare not risk them. Mixture worsted coatings are too neat in appearance to go out of fashion, but they are in less demand; whilst mixture woolens for suits are all the rage. In these goods bronze green shades have had the preference, but the taste is changing to browns, running from plain mixtures to big checks. The larger checks have seldom commanded a big sale, but the present subdued shades will give them a better chance. Indigo-blue serges are always a standard article, but even in these the rough or cheviot qualities have had to give way to fine qualities.

The change of fashion is already manifest in the serge qualities and prices of home-grown English wools, which are quite neglected. The revival of fancy worsted trousering is a welcome sign, as no branch of the cloth trade gives more room for variety and display in design. Present taste is not loud, but bolder stripes than recently in demand are now wanted. Silk twist yarns can be employed in these designs with excellent effect. The tendency of trade appears to be favoring the Huddersfield district and Scotland, but a larger export trade is still much needed.

A largely-increasing trade is being done in "costume cloths" for ladies' tailoring. This fashion has taken firm hold of the popular fancy, and bids fair to rival the former great success

of the Ottoman cloth, or soleil, which had a run of seven years. Commencing with drab covert cloths, the colorings have now extended to a variety of shades, green of varied tints being much in favor. The selections for next winter season favor compound shades, in a variety of colors from dark to light. The weaves of these goods are not elaborate, but the blending of the shades, the colorings, and the materials employed are of the first importance.

The foregoing remarks in this article on blending may be of service in making these goods. The following examples indicate the class of compound mixtures referred to:—

No. 1 compound mix.:
50 per cent. fawn.
25 per cent. mid blue.
15 per cent. bright green.
10 per cent. orange.
—
100

No. 2 compound mix.:
50 per cent. navy blue.
30 per cent. fawn brown.
10 per cent. bright red.
10 per cent. bright green.
—
100

No. 3 compound mix.:
50 per cent. dark prune.
20 per cent. black.
20 per cent. slate blue.
10 per cent. cardinal red.
—
100

No. 4 compound mix.:
35 per cent. dark brown.
30 per cent. fawn brown.
20 per cent. lavender.
15 per cent. blue white.
—
100

—Textile Manufacturer, England.

Chlorinating Wool.

Wool in a loose, spun, or woven form, in a dry or moist condition, treated with chlorine gas, a quantity not exceeding 25 litres of gas to one kilogram of wool, is the subject of a recent German patent that is looked upon as possessing some merit. In this treatment the hydrochloric acid is evolved, and the wool acquires the same properties as are conferred on it by treatment with solutions of hypochlorites, in addition to being bleached in the process. The chlorine may be diluted with air, and the rate at which the action proceeds is proportional to the concentration of the gas and to the amount of moisture present in the wool. Hence the action may be regulated so that on subsequently dyeing the goods no inequalities appear in consequence of uneven chlorination. Wool dyed with colors which are fast to chlorine may be subjected to the process. Designs are produced upon cloths by printing them with a slightly thickened solution of hygroscopic substance, such as chloride of calcium, magnesium, or zinc, and then subjecting them to the action of chlorine. Conversely, the goods may be printed with a solution of a substance which is wetted with difficulty after being dried, such as aluminium acetate, and they are then moistened and treated with chlorine, the action of which is resisted by the printed parts. The chlorinated material possesses a silky gloss, and when further treated in the usual manner with soap solutions and acids it acquires a crackling feel.

—The future of the textile school at Paterson, N. J., for silk manufacture, that was projected by William Buschmann, a silk manufacturer of that city is anything but hopeful. The effort in this direction is worthy of a better result, but it does not elicit the support of silk manufacturers as it apparently deserves.

—"Random" is a word used to describe yarns that have at intervals a short length of another colored yarn incorporated with them. These are produced by special mechanism. Knopping, or the production of a lump at intervals in the yarn, is another form of fancy yarn, and is probably the most common form of such threads.

KNITTING DEPARTMENT.

The Knit Goods Situation.

The expectations held by the knit goods trade six weeks ago, have scarcely been fulfilled. There is, taken altogether, a feeling of disappointment, shared in by almost all the hosiery and underwear departments. Late September found the underwear men relatively much better off than those in hosiery, but the "soft weather" of early October did a deal toward evening up the situation. Shaving prices to clean up fall lots brought on an irregular market, which ended, in several instances, in the unsatisfactory aid of the auction room being invoked. Large buyers have been quick to demand the advantage of the steady decrease in prices of yarns and such other small inside holds as knitters have had, have been effectually discounted. A leading jobber pointed out the fact, the other day, that practically all the small gains made since the meeting of manufacturers a year ago, to advance prices, have now been swept away. It must be said, however, that the trouble resides fully as much within the trade itself, as in the present position. There are lines of goods, to-day, for which the demand nearly equals the supply, but the demon of price cutting has become so strong and settled in the trade that many salesmen can no more help giving concessions than they can help sneezing. These concessions are frequently volunteered. The development in fancy hosiery is confined to golf goods, in which plain varieties and heather mixtures for spring are being crowded aside in favor of bright welts in combination with black or colors. Light weights, too, are increasing in popularity. Seamless hosiery of lower grades continues to be in the dumps, but overproduction continues. Seemingly the manufacturers in this line do not live to learn. On the other hand, seamless goods of fine grade, with well protected trade-marks and full-fashioned goods of better makes are oversold, several full-fashioned mills being two months behind their orders. Low grades of underwear are proportionately better off than those in hosiery.

With a sudden increase in demand for finer goods, there would be some waiting on the part of consumers, for their production involves more time. Undoubtedly much of the trade in medium and finer lines is being thrown, at least temporarily, to lower qualities. Under these circumstances the growth of the demand for fancies in underwear, on which price cutting has not had time to invade, seems heaven sent. Many long established staple brands were never worse shaken by cuts in cheap and inferior makes. Importers are getting more of such fine trade in wool and worsted underwear as develops, than the domestic trade, which shows little increase in facilities.

From Germany comes the significant indication that "misses' hose in fancy styles are not taking as readily as last year." In this connection, it is well to recall the emphasis with which the Textile World, in this column, has for three or four months declared that the rage for fancies has turned. The demand is going back to tans and black. Split sale goods have the call just now, in Chemnitz, where prices remain steady, although trade is inclined to be decidedly slack.

Hosiery importers are bothered more and more by undervaluations. Their European demand, however, has increased in volume and variety. In fancy goods, French combinations have usurped the attention of the fine trade. The middle of October, with its more seasonable temperatures and

conditions, brought some relief to the heavy weight underwear trade, which was rapidly shutting down on its output. Still the situation in this direction is far from healthful. There is not the slightest doubt that the present preponderance of trade in low grades of all sorts of knit goods is largely the natural outcome of pushing poor qualities, while better lines have been allowed to shift for themselves. Nevertheless, it will take more rocky reaping to make everybody realize what tares they have sowed.

Technicalities of Power Knitting.

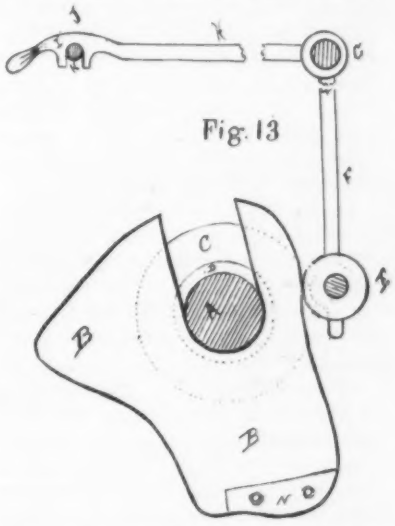
J. H. QUILTER.

(Continued from July.)

The next movements to be considered are those which control the forward and backward movements of the face of the frame. These, it will be noticed, do not commence until after the loop has been formed and divided equally between every needle, and while the sinkers are practically at the shank of the needle. This movement consists of a forward motion being given to the sinkers until their bellies pass beyond the level of the needle heads and thence back again to that position whence they started. This, at first sight, appears a simple movement, and so it is, as compared with some of the other motions, but if we follow this movement more closely we shall see that its importance is equal to, if not in advance of the motions previously explained.

Starting, we have the sinkers at their dividing point a loop around each, and in the throat of the sinker is the old loop. The nose of the sinker keeping the two at their respective distances from each other. As the sinkers move along, the new loop is, of course, in advance of the old loop and is brought under the needle beard, but during this motion the sinkers have, by the rising motion previously explained, been slightly rising so that as soon as the new loop is under the needle beard the nose clears the loop, and the belly of the sinkers, as they still further advance, brings the old loop, and pressing intervening, they land the old loop on to the needle beard and pass on till at their furthest point, which should be a distance equal to that of dividing. The reason of this is easily understood.

In dividing, each loop is at its full tension and all sinkers being level each loop is divided equally, the loops when knocked over are similarly divided by the bellies of the sinkers, and they being level again equalize each loop, leaving them finally in such a condition. What are the results



that will accrue from this motion being performed imperfectly? Should the K. O. cam not take the sinkers sufficiently forward there would be an imperfect division at the point, besides imperfect knocking over. But should it have a too forward movement then the strain put upon the loop is an undue one and detrimental to the finished appearance, besides often causing a broken thread.

While the sinkers are in the outward position the downward motion is taking place and the loops are then in the throats of the sinkers; and in this position the sinkers have their backward motion that the inner side of the sinker nose may take the loops

to their position on the shank of the needle. Of course, the sinkers move to their proper height to be ready for their next movement to form another row of loops.

The mechanical means to give the backward and forward motion are by two cams or duplicates of same, viz., The knocking-over cam and the counter cam. The former gives the forward motion while the latter carries the truck as the backward motion takes place and so keeps same steady and true. In the jack and sinker frame under discussion all sinkers swing at their upper end, and in hand frames the forward and backward motion is given by the hand bar which runs behind the tail of the sinkers, and which are held in position to same by sinker plates. In jack and sinker rotary, the power movement is the same; the knocking over levers are connected to the hand bar.

Figure 13 shows a sketch of the K. O. cam, "A" being the main shaft, and "B" the cam attached to the same, as previously described. This cam acts on the truck "E" at the end of lever "F" which extends upward from the cam shaft and has a right angled lever "H" extending to face of the frame. It is not usually fixed to the hand bar, but works on the principle shown, Brackets "J" on the hand bar have a stud "K" between them; and the end of lever "H" is shaped at "I" to fit on the stud, while it controls the face of the frame, but when disconnected the frame can fall back for the purpose of adjusting any mishap that may have occurred.

It is always necessary in all such frames to make such provision in order that the workman may, as is often required, put the machine in any position required.

The counter cam, as previously referred to, is used only on the large machines. It is placed side by side with the knocking-over cam, and the lever "F," Fig. 13, has its end in a half circle extending on the cam shaft "A." On each of the two arms are the trucks, but on opposite sides of the arms, so that the back truck controls the knocking-over and the front truck working on the counter cam allows the machine to move back steadily as it is released by the K. O. cam "B."

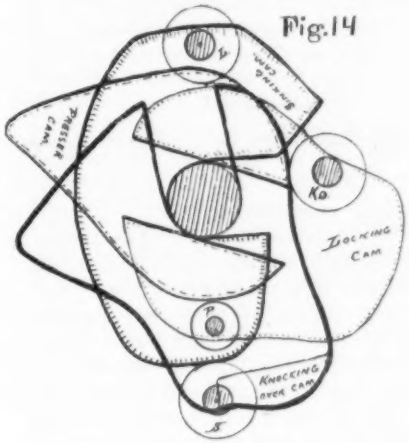
The camming of a rotary frame is most important for, as already shown, each movement must work in perfect harmony. There must be no rule of thumb here, each cam requires working out to produce its own particular movement, and then, when each of them are placed on the shaft, they require so working that each will work harmoniously with the others to produce the results mentioned, when dealing with the forming of a row of new loops. Usually such cams are first made in wood and so shaped until the result required is obtained, for a cam is not one that is adapted for each and every machine, but each machine requires its own cam, shaped according to the build of the frame, the length of needle, needle beard, and all such minor details which are to be considered, for the longer the needle the longer the forward and backward movement of the face and the frame. And so with the length of the beards as to getting the new loop under and landing the old loop on the same.

Another important example will show how accurate each movement must be, that all detail is attended to. In speaking of the presser, it was shown how exact must be its movements to close the beard just after the new loop has passed under and remain closed to let the old loop land and be away to allow this loop to travel till knocked over. But few are aware that a too sudden motion of the presser causes many defects, for though the presser is down when the old loops are landed on the beard tip, if they are allowed to open too suddenly the loop may be distributed, and in some cases fall off and so cause trick stitches. All these points show how it is that an old stockinger well up in practical knitting can, when a frame is cammed, adjust his levers and make the frames work smoother

than the mechanic who has built the machine.

Before leaving the cams, Fig. 14 will show their position and the position of the trucks on each cam. If these cams were all placed in one position and the truck at one point of the circle, each movement could be traced on each cam, and in the revolving of same the perfect movement of the frame could be traced, as can be seen in the sketch, if each cam is taken from the truck which stands at its stationary position previous to the drawing of the jack.

Again, the importance of not trifling with the cams must be pointed out,



all adjustments can be made at the lever. The knocking over is the one that is most liable to wear, but at "N," Fig. 13, it will be seen that an adjustable plate is fixed at the extreme knocking over part of the cam, and this can be adjusted to equalize an excessive wear that may take place.

A knitter who studies the principles of the cams and their action on the line laid down in this article cannot fail to find it most advantageous, not only by becoming better acquainted with the actual machine he studied, but by understanding the elements of the true principles that govern all rotary machines, using jacks and sinkers, or their equivalent, which includes all rotaries having the spring or bearded needle.

Loss in Weight of Hosiery in Process.

Editor Textile World.

I am troubled a good deal to know what becomes of my stock. I find a discrepancy in weights between the number of pounds of yarn weighed out to my operatives and the amount weighed back in finished goods, ravelings, run offs, waste, etc. What becomes of it? I have read somewhere that cotton yarn will hold a per cent. of moisture. Now what per cent. of moisture should it lose in coming from an outside storehouse into a warm room and then made into hosiery?

MAC.

Michigan.

This inquiry opens up an interesting question. There should not be any appreciable shrinkage in weight of yarn from drying out. Perhaps the loss may not be wholly accounted for by the evaporation of moisture. We should be more inclined to think that there was some channel for waste which had not been accounted for in the weighings. We have known many instances where operatives conceal the waste. We have interviewed several manufacturers and knitters on the subject, and should be glad to hear from any others who think they could throw any light on our correspondent's difficulties. A manufacturer of long experience in cotton hosiery says:

"I am of the opinion that his trouble arises from the fact that he weighs out his yarn in small lots and gives 'down weight' each time, just the same as a grocer does in weighing out a barrel of sugar one pound at a time. His barrel of sugar will not hold out in weight. The shrinkage in a case of cotton yarn is very small from drying out. There is fully as much shrinkage in the wood of the case as in the yarn, unless the yarn is excessively damp. The ravelings, run-off, waste, etc., are easily accounted for, unless it goes down into the closet. When the yarn

comes into the mill from the spinner there should be a certain net weight in the case. It might absorb, say one per cent. of moisture. After the yarn had dried out it should show the original net weight. It is possible he is not getting the weight he buys. I have known some mills to send out yarn which fell short, and I have also known of mills whose yarn would over run from one to two pounds. I am at a loss to find any other reason for his shortage."

The superintendent of a very large New England mill says:

"The question is one of much importance to manufacturers. The English style is to keep the cotton damp all the time, by setting the boxes of cops in a damp place in the cellar over night. I have done it myself, not to make it weigh heavy, but to take the kink out. Yarn will not knit if it kinks. Now I will say something about cotton from the ball to the fabric. Cotton, when first opened, will have from 3½ to 8 per cent. moisture. Now the question is, how much does it naturally hold? I reckon it holds one per cent. of its own weight all the way through. In some of the English mills they open 20 bales at one time, and give it a thorough mixing by taking a handful from each bale, and putting it through the willow, as it was called when I worked in the card room. What is the cause for loss of weight, is more than I can tell. All I can say is, about 30 per cent. will be lost in going through the card and mule rooms. Of course this is not all lost, a good deal is short fibre and can be used for something else. He will lose from 4 to 5 per cent. in spooling, 15 per cent. in knitting, 5 per cent. in cutting, and 2 per cent. in raveling. Not much should be lost in stitching, nor until the goods are inspected, then 15 per cent. may be reckoned for seconds. If your correspondent will follow up his spooling, he will find out where he loses. If the yarn is properly spooled, all the bunches taken out, and all the fine places, he will find no difficulty in getting at the bottom of his waste account. Also see that the guides do not rest on the spooling frames. If they do the yarn will shell off and cause press-offs on the knitting frames. I should have said in the beginning that cotton after being opened should be kept in a room with the temperature 168 to 170 degrees for 12 hours."

A knitter of woolen goods, to whom we mentioned the subject, says that in woolen yarn the shrinkage allowed is three-quarters of an ounce to the pound, but he thinks in cotton it would be more. If the cotton yarn was kept in a cold or damp room, it would gather up moisture, but to what extent, he could not say. Sometimes there is an extra loss in winding and raveling.

The Quandaries of a Hosiery Manufacturer.

Editor Textile World:

I am a small Western manufacturer of hosiery, having worked mostly on woolen and worsted goods, and find that I must get improved knitting machines or quit business. I am thinking of getting three-quarter automatic knitters. I would like to arrange to run my machinery on cotton as well as wool, if I can do so at a profit. I have no dyeing plant. Does dyed cotton yarn knit as well as white? How much more per pound would a good black yarn cost? Do you think I could meet competition on cotton goods? For example, one of my competitors is selling rib, 176-needle goods that average 2½ pounds to the dozen, for 90 cents,—6 to 9½. They are made from good, strong, two-ply yarn, with double knees. A Philadelphia spinner offers me the yarn dyed and coned at 30 cents. The freight would cost me one cent per pound, which would leave me five cents per pound for knitting, finishing, boxing and selling. What line of production would you advise, plain or rib, the gauge, etc.? What price is

usually paid operators for looping 160-needle work?

HOSIERY.

This manufacturer is confronted with an experience which comes to all knitters, large or small, who do not keep in touch with the modern methods and up-to-date machinery. Competition has become so keen, and the methods of selling so complete, that there is not a town or village in any part of the country where goods made under most improved conditions, and upon most modern machinery, do not find their way to compete with the local product of a small manufacturer at such prices as compel him to adopt modern methods, or, as this man says "quit business." In this particular case, our corespondent labors under a disadvantage in being so far from his yarn market, and also from proper dyeing and finishing facilities. With his small plant it would hardly pay him to do his own dyeing.

There is some difference of opinion as to whether dyed cotton yarn will knit as well as white. Most knitters think it does not. It depends very largely on the way in which it is dyed. Combed yarn properly dyed and well softened will knit very well, but black and other dark shades are very hard on the knitter's eyes, and it is much more difficult to detect imperfections, so there will be more bad work and less product. The only alternative in this case would be to knit the goods in white and send them to some good hosiery dyer and finisher and then have them sold in that vicinity, for a long freight haul to the dye works and back again would wipe out still more of the already small margin. The best Diamine Black, absolutely fast, costs 10c. to 11c. above white yarns. Common logwood blacks cost about 7c. more than white. The price quoted for yarn dyed in cone seems high, but not knowing the size and quality of the yarn, it is impossible to say. No. 20's yarn on cone, best mule spun, is quoted at 16c. (white).

Considering our correspondent's location and especially if he is going to manufacture cotton goods, we think that he had better confine himself to plain work. Price usually paid for looping 160 needle work is about 5c. per dozen.

In the matter of machinery, we should advise careful investigation of the merits of the different automatic knitters, and from builders can be obtained details in regard to production and experience of other manufacturers, which will enable him to make valuable comparisons with his own present costs. We think the price you quote your competitor as selling goods at is very low. We know of Western mills that are selling ribbed 2½ pound goods for $1.25 and upwards.

We invite correspondence on this subject.

Imitation Lambskin.

We notice in one of our foreign exchanges a new design made on the circular knitting frame, for an imitation lambskin. The idea is fairly well represented in figures 1 and 2. Not only is the fabric of interest to our readers, but the mechanical method by which it is produced must be equally so. The inventor of this fabric, or of the method of its production, refers to an improved circular knitting frame with sinkers for cutting the back loops, which was the subject of an invention in 1895.

The imitation lambskin, Fig. 2, is made from a woolen plush fabric knitted on a circular frame, so that each stitch or loop of the fabric is of double thread, that of the groundwork being of cotton or wool and forming a plain fabric, and that of the plush pile being of wool, the long sinker loops of which hang at the back of the fabric. These long loops are cut by shears or knives, and the fabric is treated with a hot solution of soap until the pile becomes felted into tufts or bundles. The fabric is then cooled, dried, dyed or treated with sulphur, dried, stretched, and shorn in the usual manner.

The particular circular frame referred to as being the subject of a patent three years ago, may be understood by the accompanying illustrations, Figs. 6, 7, 8, 9 and 10, and a further idea of what the machine is capable of doing may be obtained by a perusal of Figs. 3, 4 and 5.

On this frame, plush goods are made by loop wheels M, Fig. 6, which has sinkers P^1, with two hooks, or nibs, A and B, Fig. 9, of different depth, the lower one laying the long loop B of one thread, while the upper one lays a short loop of another thread. Each

Fig. 1 Fig. 2

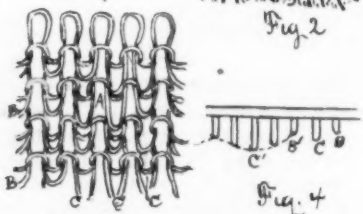


Fig. 3 Fig. 4

Fig. 5

stitch of the fabric is composed of a double thread, that of the groundwork A, Fig. 3, which makes plain fabric, and that of the plush B C, the long sinker loops of which hang free at the back of the work. These long loops B C are cut (B^1 C^1) by the sinkers themselves, which move different kinds of cutters, as for instance, shears, G F, Figs. 7 and 8, and seen in Fig. 6, being moved by suitable guides H, and sharpened at the upper front part, the sinker itself being sharpened in a hook, or nib, which sinks the plush loop—both parts working together like a pair of scissors in cutting the thread, as Fig. 9 shows it. Or, there is another set of steel plates in the loop wheel around the sinkers, or in a special guide ring around the loop wheel. The blades are moved by guides in such a manner as to work in the upper sharpened part, together with a sharpened sinker nib, like a pair of scissors.

In this plush fabric, patterns can be made by working the two different sorts of plush, some with cut loops,

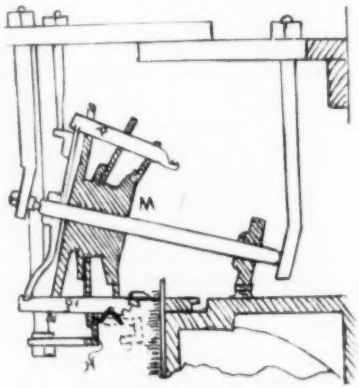


Fig. 6

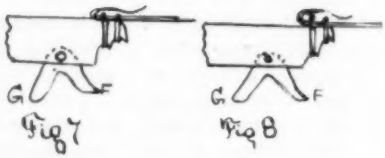


Fig. 7 Fig. 8

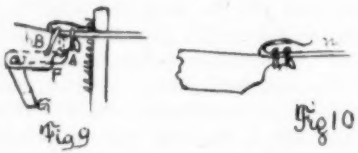


Fig. 9 Fig. 10

Figs. 3 and 4, and others with uncut loops, also in Figs. 3 and 4, in different places in one fabric, and those patterns may again be changed in many ways by producing plush loops of different lengths. These combinations are to be obtained by putting the different sorts of sinkers into a loop wheel.

The order in which these sinkers are to be put into the loop wheel for producing certain designs, is to be found

in the pattern drawing, as, for instance, Fig. 5, it being understood that an empty square is a stitch in the fabric with a short loop, and that a filled square is a stitch with a long loop, both of cut plush, then there are only sinkers with cutters to be put into the loop wheel, but these sinkers are to have different nibs, or hooks, for the plush loop. The order and quantity of these short and long hooked sinkers is to be read, however, from the drawing Fig. 5, exactly in the same way as the order of the teeth and spaces, in a tuck presser wheel, is found in a similar design. For instance, in the row D, read in the direction of the arrow, the result will be; five sinkers (short hooked for B', which are brought into the loop wheel).

The sum of stitches in a pattern is equal to the sum of sinkers in the loop wheel or in the loop wheels, if there are more than one used for producing the pattern. Then, the loop wheel will work the designed pattern as a plush of longer or higher loops than the other common fabric, all in cut plush.

Efficiency of Trimmers on Looping Machines.

One of the operations on the seamless stocking, which causes the greatest trouble, is the looping of the toe. The operation is necessarily slow, because the operator is expected to deposit each successive stitch of the same course upon the points of the looper. If each stitch is not caught, there must consequently be a drop stitch, which means a mender. If no trimmer is used, of course the operator is compelled to use a pair of scissors, and a brush for the purpose of clearing the work down to the points of the looper.

As manufacturers pursue different methods in turning out their work, they make different conditions for the loopers or operators to contend with. For instance, in knitting half-hose, the stocking is commenced at the top and run off at the toe. This mode of operation making it much easier to ravel, than where the knitting commences at the toe and either knit in a string or run off at the top. It also makes quite a difference in the appearance of the loop knitted. Thus, one will find that while a good operator is capable of running on forty dozen of work pressed off at the toe, he can perhaps not finish more than thirty dozen pressed off at the top of the stocking.

This being the fact, in order to turn out the same amount of work commenced at the toe, there should be a trimmer attached to the looping machine. But there is quite a prejudice against the trimmer on looping machines, and for the cause stated above, i.e., if the stocking is not run on the points in the same wale, the trimmer knife will cut a hole. But there are trimmers, and there are trimmers.

There have been very good results from a trimmer made with two round revolving discs as cutters. It is apparent that if one knife slides horizontally across a stationary blade or one revolving disc, there is a tendency to push the work out of line, stitching the loop and perhaps breaking one, thus causing a hole, while with the revolving discs, the allignment is not disturbed, and if the blades are of the round character, you have on an inch cutter, say three inches of cutting edge, which is continually changing the position of the cutting edges.

Such a trimmer, properly applied, would be advantageous to employer and employee.

GIBBONS FRAME.

—The "exclusif" trade in England, in woolen and worsted cloth goods is done through London, and by comparatively few merchants, some of them having houses in Paris. This class of trade is known as the West End trade, and may virtually be termed a monopoly of these high-class firms, who claim the first inspection and first offer of the latest novelties.

—The country has undoubtedly reached the termination of the period of depreciation.

POWER DEPARTMENT

ELECTRICITY—STEAM—WATER.

Water Purification by Filtration.

We give, herewith, two illustrations, representative of a system of water purification by filtration, owned and controlled by the New York Filter Mfg. Company, 26 Cortlandt St., New York City, which, for water works of cities, towns, public and private institutions, textile mills, bleacheries, dye-houses, paper mills, etc., etc., is consistently claimed to be superior to that of any other system in existence, embodying all of the merits of well known filters, as the Hyatt, the Jewell, the Warren, besides other types.

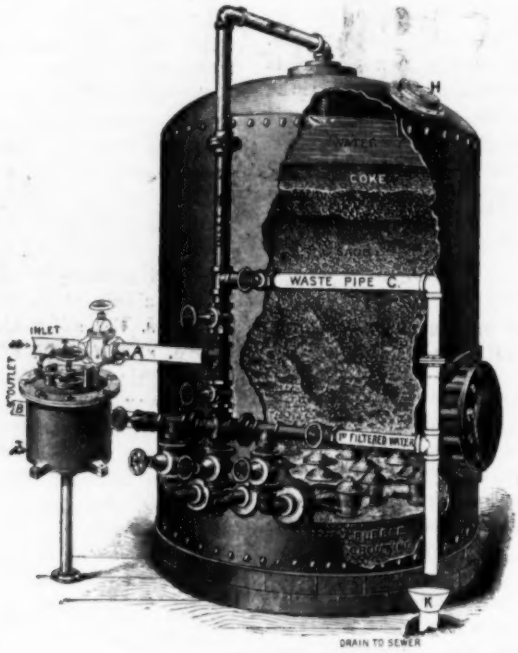


FIG. 1.

The most important feature in the system of mechanical filtration we refer to is the use of a coagulant in connection with a filter. Absolutely pure water is seldom found in nature, as it readily absorbs impurities from the air and soil with which it comes in contact. The so-called pure water of natural springs is often impregnated, to a great extent, with soluble substances derived from the rocks it passes over. If the water is taken from a lake or pond, it is discolored and stained by the roots of trees, peat, leaves, etc., and contains impurities both of vegetable and organic nature, which it holds in solution and suspension. All of these impurities can be removed by scientifically applied mechanical filtration. In a large number

of cases, this process of filtration alone is all that is required to remove impurities which are present. These impurities are usually associated with mud, dirt, and other suspended matter, and when this suspended matter is filtered out, the water is ordinarily adequately purified. In case filtration, alone, is not sufficient, recourse is had to a second novel and distinctive process. This consists in the treatment of the water prior to its filtration, with a coagulating agent, which separates and precipitates from the water the impurities that otherwise would escape the arresting action of the filter. To produce uniform colors in a textile mill, a uniform quality of water is necessary; in fact, it is of the utmost importance, and can always be had by means of a mechanical filter, using a coagulant. Without a coagulant, a uniform quality of water cannot be assured. This latter feature in the system is patented, and the patent is owned by the New York Filter Mfg. Co., and has been the subject of costly litigation during the past ten years, resulting in four decisions by the United States courts, establishing the validity of the patent.

Referring to our illustrations, Fig. 1 shows a vertical type of sectional washing pressure filters from 30 inches diameter up to 10 feet diameter. The wash water under pressure enters the filter at bottom, passes up and out at top; the entire force of this reverse current used in washing is directed against one-third of the bed only, for about five minutes, then it is shut off and the central one-third of the bed is scoured in the same manner; lastly the remaining one-third is washed.

By this system of washing the filter-bed, a thorough attrition and scouring of particles is accomplished, as the entire supply of water and pressure is directed against the one-third of the bed being washed, and no partitions

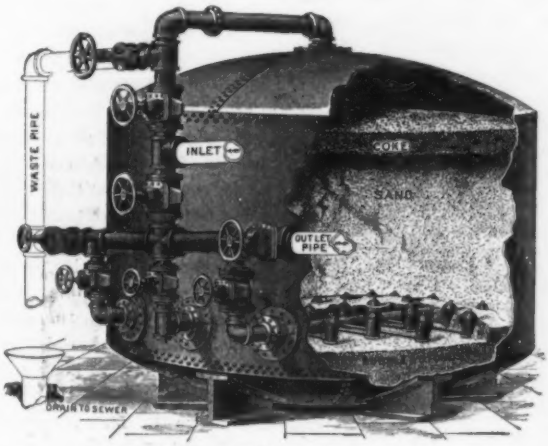


FIG. 2.

are necessary to divide the bed, as the current is forced up nearly in a straight line. No power or machinery for stirring the bed is required when cleansing filters by sectional washing.

Fig. 2 represents another form of the same kind of filter, suitable for large mills and city water works.

The filter is in use by such well known establishments as the following: Norfolk & New Brunswick Hosiery Co., New Brunswick, N. J., which has found it equal in all respects to what was claimed for it, occasioning very little cost for repairs; The Valley Worsted Mills, Providence, R. I., which refer to the filter as working well, giving bright, clear water for their dye-house, etc.; Belding, Paul

& Co. (silk manufacturers), Montreal, Canada, who, previous to the introduction of the filter, had great trouble in dyeing light colors, but since its use, have obtained these without trouble; The Mohawk Valley Knitting Mills, Mohawk, N. Y., which have used this filter for three years with the greatest satisfaction, at a saving of over $1000 per annum, effected at a cost of $630. Among other textile users of this system of filtration, may be mentioned the Willimantic Linen Co., Willimantic, Conn.; Cheney Bros., S. Manchester, Conn.; The Hockanum Co., Rockville, Conn.; Wayne Knitting Mills, Fort Wayne, Ind.; Kerr Thread Co., Fall River, Mass.; Lowell Bleachery and Dye Works, Lowell, Mass.; Root Mfg. Co., Cohoes, N. Y.; Quaker City Dye Works Co., Philadelphia, Pa.; Firth & Foster Bros., Philadelphia, Pa.; R. Greenwood & Bault, Philadelphia, Pa.; Phoenix Woolen Co., E. Greenwich, R. I.

Artificial Draft.

"Artificial draft," so states W. S. Hutton, "can be readily adjusted to effect the combustion of different kinds of fuel at different rates of combustion. It permits efficient combustion of fuel of inferior quality, and enables a steady supply of steam to be maintained, independent of climate and weather. It enables the supply of air to be properly distributed to the fuel in the furnace to effect economical combustion. The supply of air above the fuel can be readily adjusted to effect combustion of the gases evolved by the fuel, and the supply of air below the fuel can be regulated to effect the combustion of the solid portion of the fuel, and the movement of the hot gases can be readily controlled."

There is no valuable feature of the chimney that is not possessed by the fan to at least the same, and in many cases to a more marked degree. The very features which are most conducive to economy are those which are incidental to the use of the fan for draft production. While the recent extensive introduction of induced draft in stationary practice has done much to emphasize the advantages of this system, the general superiority of mechanical draft, properly applied, has long been recognized by those who have given careful consideration to the matter.—Extract from Treatise on Mechanical Draft, published by B. F. Sturtevant Co., Boston, Mass.

Setting Engine Valves.

THE RUSSELL ENGINE.

Among the single valve automatic engines considered to be standard, is that manufactured at Massilon, Ohio, by the Russell Engine Co.

The setting of this class of valve is in itself a simple matter and yet many engineers unfamiliar with it will find the following detailed description of interest.

The style of valve is shown in cut, Fig. 1. It is, to some extent, a moving steam chest, with the steam all within itself, admitting only enough steam into the chest to keep the valve to its seat, against the maximum tendency to leave it. This pressure in the chest is found with the valve, as at present proportioned, to be about 45 per cent. of that contained within the valve. The cut shows the valve and section of cylinders so plainly as to render any detailed explanation of same almost unnecessary.

The eccentric operating the valve is under the control of the governor as shown in cut, Fig. 2, which regulates the speed of the engine by sliding the eccentric across the shaft, either forward or backward, as the weights change their position, thereby cutting the steam off earlier or later in the stroke, as the governor, or, more properly, the weights adjust themselves to the load.

When the eccentric is moved across the shaft in a direction that reduces its eccentricity, the steam is cut off

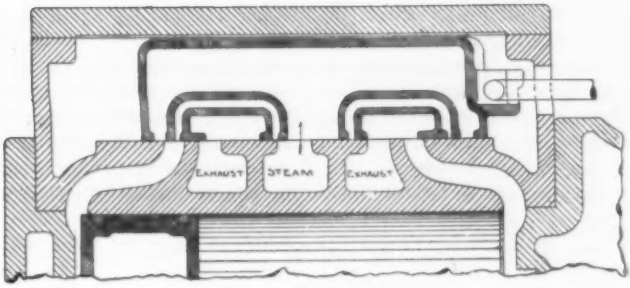


FIG. 1.

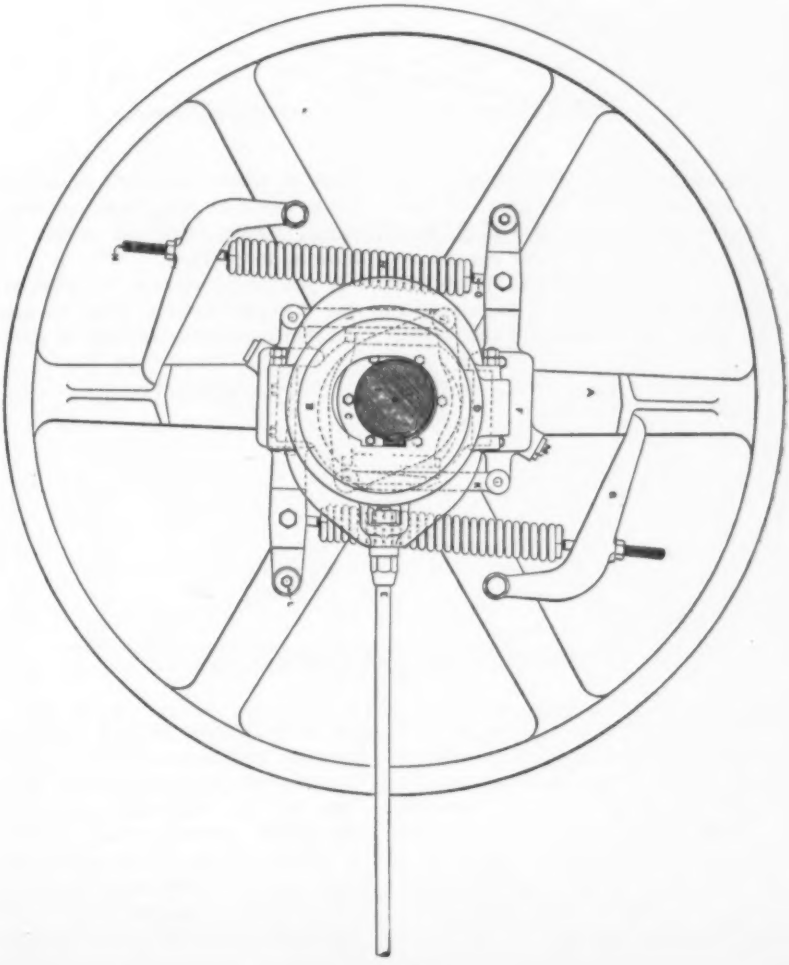


FIG. 2.

earlier in the stroke; when the eccentric is moved in the opposite direction, the steam is cut off later in the stroke. The extreme range of this cut-off is from 0 to ¾ of the engine's stroke, and this whole range of adjustment is under complete control of the governor.

To preserve a certain determined speed, with the smallest possible variation, as changes occur in the load or presure, is the function of the governor. The cut-off must always be proportioned to the load. When the engine is running empty, the steam is cut off at the beginning of the stroke, and the governor weights are at their extreme outer position. With a heavy load, steam follows further, and the weights are nearer their inner position.

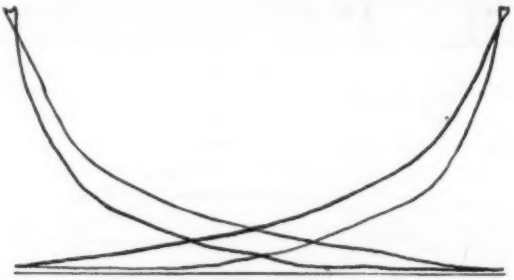


FIG. 3.

Between these two limits, any number of positions of the weights, and corresponding angular positions of the eccentric may be had, and as the steam is thus adapted to the load in each position, it follows that a slight increase or decrease in speed must make a change in the cut-off, and bring the engine again to standard speed.

In setting the valves it is necessary to mark the ports in the valve face at the outer edge of the steam chest, and also to mark on the back of the valve the ports in its face, so that it may be adjusted after being placed in the chest, in which position it presents a blank surface that, without these marks, would afford no means for knowing its position.

In placing the valve in the chest, see that it fits perfectly against the seat, and that the bottom bearing, on which the valve rides, is at right angles to the valve seat, and in such a condition that the valve will not be tipped away from its seat, but rather against it. This latter condition will be insured by easing off the bottom strip at the inner corner, so that the valve would bear hardest at the outer edge. The hinge nut, into which the valve stem is screwed, as well as its trunnion bearings, should fit so that the valve

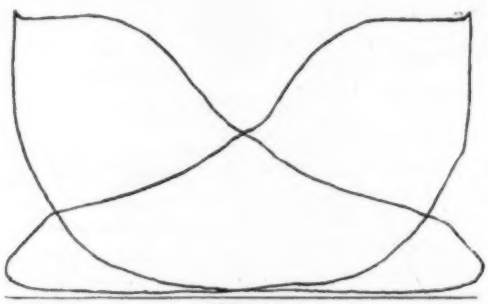


FIG. 4.

lays closely to its seat, rather than be held away from it.

Having extended the marks of the ports as well in the valve seat as in the valve itself to the outside, it now becomes necessary to get the centre of the travel of the eccentric, and connect the valve and rod, so that the valve will travel equally on either side of this centre. The throw of the eccentric leads the crank in the direction the engine runs, and with the eccentric properly located, as it cannot help being, because it is attached to the governor and the governor is keyed to the shaft, the lead will remain the same with the governor weights in their outer, as well.

These valves are usually marked with the engine on the centre at either end, marks corresponding with the admission edges of valve and seat. The hinge nut connection makes it convenient to examine these valves without disconnecting or disturbing any adjustments made. The valve rod has right and left-hand threads for adjustment, and final adjustment can be made without taking off the steam chest cover.

Of course, the proper way to make the final adjustment is by the aid of an indicator, but if the indicator is not at hand the engineer can, by the use of the right and left-hand threads, adjust the valve to a nicety.

While the engine is running slowly, leave the holes for the indicator connection open, and notice the sound of the steam escaping through these openings. Then, with a wrench on the valve stem, the sound can be made even at both ends, and the valve will be surprisingly close to the proper point of adjustment. In fact, a good ear can adjust in this way so closely

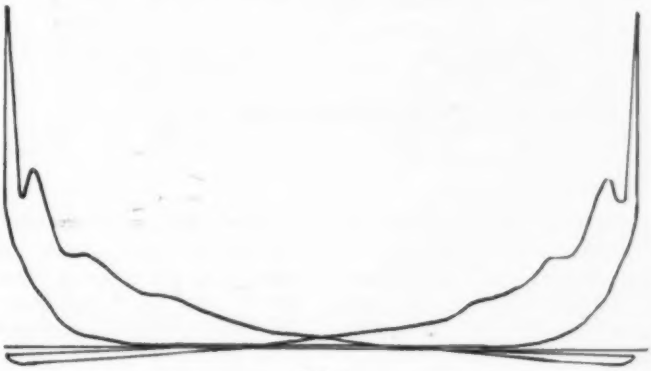


FIG. 5.

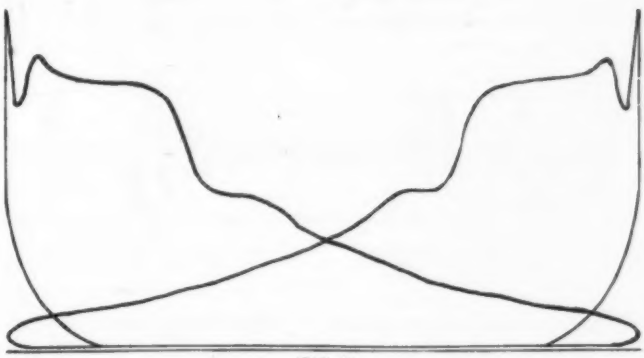


FIG. 6.

that a subsequent indicator test will fail to find very much wrong.

The two indicator cards, Figs. 3 and 4, illustrate very nicely the variation in compression for different cut-offs. The first card being taken with scarcely any more load than friction of the engine, the cut-off occurs at the beginning of the stroke, and as all the functions of admission, cut-off, release and compression are performed by one valve, it follows that when the cut-off is early all the other functions will be correspondingly early; hence, the variation in compression at different loads.

This is a point that the engineer will do well to remember, as it plays an important part in this class of engines, and has led some writers to suggest that the proper name for engines of this kind would be compression engines.

Diagrams, shown in Figs. 5 and 6, are taken from another class of automatic engines, in which admission and cut-off is controlled by two separate valves, Fig. 7, and where, as in the Russell four-valve automatic engine, the exhaust is controlled by a separate arrangement of valves (Fig. 8). This arrangement has many advantages over the single valve type, as the admission, release and compression all remain constant for whatever cut-off; the economy of the engine is not nearly so dependent on a certain point of cut-off as the single valve type.

To be continued.

—In associated effort there is power. The results that seem impossible of realization by individual effort frequently blossom into fruition under the rays of concentrated energy.

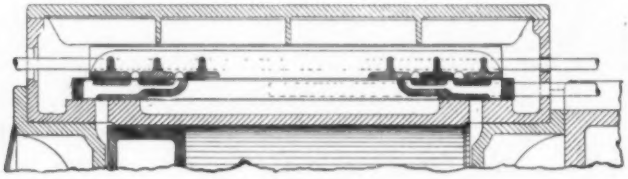


FIG. 7.

—For fine worsted trouserings few weaves are more largely used than those of a cord class. One reason for this is their smart and neat appearance when correctly constructed.

—There is no scheme of woven designing capable of more extended elaboration than that of the double plain.

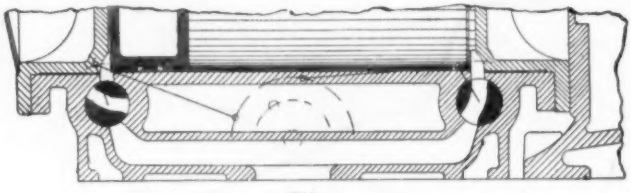


FIG. 8.

—The bookkeeping of a business is its historical record. The record to be of real value must not only be correct in details but must also be scientific in arrangement.

—Dating ahead within proper limits may be desirable, but, as it is commonly practiced, it has become a nuisance, and is a direct and certain cause of loss.

—Linen has the honor of being one of the earliest fabrics, and from prehistoric ages has been held in high esteem.

DYEING DEPARTMENT.

Dye Recipes for November.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16 page pamphlet, in convenient form for preservation. Subscription price for the TEXTILE WORLD with the Dyers' Supplement is $3.

RECIPE NO. 161.

Light Red on Woolen Yarn.

Acid Rubine on 100 pounds woolen yarn.

Prepare dye bath with

1½ lbs. Acid Rubine No. 2424.
(The Hanna-Schoellkopf Co., Philadelphia, Penn.)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter in yarn at 120° F., bring to boil while turning, and turn to shade at that heat.

Acid Rubine, as shown above, dyes a fine shade of color, bordering on the bluish tone. This color will be found useful for toning scarlets and reds, as it combines with all acid colors. (See recipe 119 for a red from Acid Rubine 3110, and recipe 165, this issue).

RECIPE NO. 162.

Blue on Woolen Yarn.

Blue A and Fast Acid Violet R on 100 pounds wool yarn.

Prepare dye bath with

1½ lbs. Patent Blue A.
1½ lbs. Fast Acid Violet R.
(Victor Koechl & Co., 122 Hudson St., New York.)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter in yarn at 140° F., bring to boil while turning, and turn to shade at that heat.

By combining Patent Blue A and Fast Acid Violet R, a number of shades of blue can be obtained, which are fast, and quickly dyed, at a low cost. (See recipe 175 in this issue).

RECIPE NO. 163.

Medium Brown on Cotton Yarn.

Rhine Brown G G on 100 pounds cotton yarn.

Prepare dye bath with

3 lbs. Rhine Brown G G.
(O. S. Janney & Co., 8-10 Letitia St., Philadelphia.)
2 lbs. Soda.
20 lbs. Common Salt.

Enter in yarn at boil, and turn one hour at that heat, lift out and work 15 minutes at boil, in a bath of

2 lbs. Blue Vitriol.
1 lb. Bichromate of Potash.

Rinse off.

We give here a very fast shade of Brown that is fast to light, soap, washing and acid. Dyers will find it to work equally as well as Cutch brown. This dye works very level on the fibre. For future kettles use less color. (See recipe 130).

RECIPE NO. 164.

Black on Worsted Yarn.

Wool Jet Black 2 B on 100 pounds worsted yarn.

Prepare dye bath with

6 lbs. Wool Jet Black 2 B.
(New York & Boston Dyewood Co., 55 Beekman St., New York.)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter in yarn at 140°, bring to boil while turning, and turn to shade at that heat.

Wool Jet Black 2 B is another one of the blacks that produce in itself a fine full shade, very fast, and penetrating the thickest fibre.

RECIPE NO. 165.

Medium Red on Woolen Yarn.

Acid Rubine 2424 on 100 pounds woolen yarn.

Prepare dye bath with

3 lbs. Acid Rubine No. 2424
(The Hanna-Schoellkopf Co., Philadelphia, Pa.)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter in yarn at 120° F., bring to boil while turning, and turn to shade at that heat.

A full, deep and rich shade is shown above, dyed with Acid Rubine. The color dyes perfectly level on the fibre, and is fast to rubbing. (See recipe 161 in this issue).

RECIPE NO. 166.

Slate on Cotton Yarn.

Direct Black G on 100 pounds cotton yarn.

Prepare dye bath with

10 oz. Direct Black G.
(A. Klipstein & Co., 121 Pearl St., New York.)
8 lbs. Common Salt.
4 oz. Soda.

Enter in yarn at 160° F., bring to boil while turning, and turn one hour at that heat.

Direct Black G, with small amounts of color, will produce fine shades of drabs, grays, slates, etc., dyeing perfectly even on the fibre.

RECIPE NO. 167.

Dark Blue on Worsted Yarn.

Dark Fast Blue on 100 pounds worsted yarn.

Mordant at boil for 1½ hours with

3 lbs. Bichromate of Potash.
2 lbs. Tartar.

Rinse and dye in a bath of

8 lbs. Phenocyanine T B.
2 lbs. Solid Hematine.
(A. Klipstein & Co., 122 Pearl St., New York.)
2 lbs. Acetic Acid

Enter in yarn at 140°, bring to boil while turning, and turn to shade at that heat.

A low cost and fast blue can be obtained by the above combination. Light or dark shades can be had by using more or less of the solid Hematine. Shades dyed with the above two colors are fast to fulling and light. (See recipes 140 and 152 for a light blue.)

RECIPE NO. 168.

Bronze Brown on Cotton Yarn.

Direct Orange R and Black B on 100 pounds cotton yarn.

Prepare dye bath with

3 lbs. Direct Orange R.
1 lb. Direct Black B.
(Sykes & Street, 85 Water St., New York.)
25 lbs. Common Salt.

Enter in yarn at 170° F., bring temperature to boil while turning, and turn one hour at that heat. For future kettles, use less of the colors.

The above two colors combine very well in producing different shades. They work level on the yarn. The shades are fast, and the quick manner in which they are produced gives the dyes desirable advantages. (See recipe 94 for an orange from Direct Orange R, and recipe 158 for a black from Direct Black B.)

RECIPE NO. 169.

Orange on Cotton Yarn.

Direct Orange K Y on 100 pounds cotton yarn.

Prepare dye bath with

1¼ lbs. Direct Orange K Y.
(John J. Keller & Co., 104 Murray St., New York).
20 lbs. Common Salt.

Enter in yarn at boil, and turn one hour at that heat.

RECIPE NO. 170.

Blue on Woolen Cloth.

Sulfazon Blue B on 100 pounds woolen cloth.

Prepare dye bath with

4 lbs. Sulfazon Blue B.
(C. Bischoff & Co., 87 Park Place, New York.)
10 lbs. Acetate of Ammonia.

Enter in cloth at 120°, bring to boil while turning, and turn to shade at that heat.

Sulfazon Blue B is fast to sunlight and washing. The color works on the fibre slowly, and dyes level shades. It combines with Anthracene Green E B (see recipe 151). An after treatment with Fluoride of Chrome or Bichromate of Potash makes the blue absolutely fast to fulling.

RECIPE NO. 171.

Orange on Cotton Flannel.

Diamine Orange D C on ten pieces of cotton flannel (100 lbs.)

Prepare dye bath with

¾ lb. Diamine Orange D C.
(Wm. J. Matheson & Co., 182 Front St., New York.)

10 lbs. Glauber's Salt.
1 lb. Soda Crystals.

Enter in cloth at boil, and run one hour at that heat.

Diamine Orange D C dyes a level shade on all kinds of cotton, either in the piece, skein, or on the raw stock. It penetrates the thickest fibre, and lifts slowly, resulting in even dyeings. (See recipe 155, which calls for a larger quantity of dye.)

RECIPE NO. 172.

Dark Blue on Cotton Knit Goods.

Direct Navy Blue on 100 pounds cotton knit goods.

Prepare dye bath with

2½ lbs. Direct Navy Blue 5096.
(The Stone & Ware Co., 157 Maiden Lane, New York.)
15 lbs. Common Salt.

Enter in cloth and run one hour at that heat.

Direct Navy Blue combines readily with similar direct colors. The shades produced are fast, and with a four per cent. dyeing, an extra dark shade of blue can be produced at a small cost. (See recipes 40, 61 and 66).

RECIPE NO. 173.

Pink on Cotton Flannel.

Diphenyl Violet R on 15 pieces cotton flannel (100 pounds).

Prepare dye bath with

8 oz. Diphenyl Violet R.
(John J. Keller & Co., 104 Murray St., New York.)
10 lbs. Common Salt.
¼ lb. Soda Crystals.

Enter in cloth at 160° F., bring to boil while turning, and turn to shade at that heat.

Diphenyl Violet R being of a reddish cast of violet, can be toned down by adding one of the Diphenyl Blues to it, which works in the same way. (We have used Diphenyl dyes in a number of recipes. We may note the following: Nos. 67, 88, 96, 101, 106, 117 and 137.)

RECIPE NO. 174.

Dark Slate on Cotton Flannel.

Vidal Black on ten pieces cotton flannel (100 lbs.).

Prepare dye bath with

7½ lbs. Vidal Black.
(Sykes & Street, 85 Water St., New York.)
100 lbs. Common Salt.
5 lbs. Carbonate of Soda.

Enter in cloth at 150°, bring up to 200°, and run one hour at that heat; lift out and run one-half hour in separate bath at 150°, of

4 lbs. Bichromate of Potash.
4 lbs. Sulphuric Acid.

Rinse.

Slates, as well as blacks, can be made fast by topping off with Bichromate of Potash and Sulphuric Acid. The colors dyed with Vidal Black will not rub or bleed, and will work very level on the fibre. (See recipe 131.)

RECIPE NO. 175.

Blue on Worsted Yarn.

Blue A and Fast Acid Violet R on 100 pounds worsted yarn.

Prepare dye bath with

2 lbs. Patent Blue A.
1 lb. Fast Acid Violet R.
(Victor Koechl & Co., 122 Hudson St., New York.)
4 lbs. Sulpuhric Acid.
10 lbs. Glauber's Salt.

Enter in yarn at 130° F., bring to boil while turning, and turn to shade at that heat.

The above two colors will dye a variety of blue shades, perfectly fast. They need no comments, as they are well known among dyers. (See recipes 113, 133, 138 and 149, and recipe 162, this issue.)

RECIPE NO. 176.

Brown on Cotton Yarn.

Benzo Chrome Brown B on 100 pounds cotton yarn.

Prepare dye bath with

4 lbs. Benzo Chrome Brown B.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
15 lbs. Common Salt.

Enter in yarn at boil, turn one hour at that heat; rinse off and turn one-half hour at boil in a separate bath to which

3 lbs. Bichromate of Potash.
3 lbs. Sulphate of Copper.
½ lb. Acetic Acid

have been added.

The above method of dyeing fast shades of brown will be found very

simple, as well as cheap. The colors treated with Bichromate of Potash and Sulphate of Copper are fast against washing and will not bleed or run into white or light colors when washed along with them. (See recipe 157, in which less dye is used for a shade of brown.)

New Dyes.

We present in this issue a number of recipes in which dyes are used that have not within recent dates appeared in the Dyers' Supplement.

A very attractive shade of slate on cotton yarn appears in recipe 166, obtained from the use of Direct Black G, furnished by A. Klipstein & Co., New York. Direct colors have been furnished by this house in previous recipes, which have met with excellent results in dye-house practice, according to the testimony of dyers with whom we have come into correspondence.

In recipe 170, will be found the use of Sulfazon Blue B, furnished by C. Bischoff & Co., New York, for the production of a blue on woolen cloth. This is a one-dip color, and may be dyed with acid. It stands sunlight exceedingly well, and gives perfectly level shades, without crocking. Should dyers desire to ascertain the merits and scope of this dye, we would suggest their writing to the above house for their color card relating to this dye. Sulfazon Blues, on account of their fine, vivid shades, with a greenish cast, are particularly suitable for light and medium blue tints, as well as cheap dark shades, when in combination with New Azo Black. Cotton threads will not be affected by the dyeing. The shades produced resist subsequent processes of carbonizing or steaming.

John J. Keller & Co., New York, furnish meritorious dyes in recipes 169 and 173, suitable for cotton. In recipe 169, an orange is obtained from the use of Direct Orange KY, which belongs to the fastest oranges to be procured. It is well adapted for union goods, dyeing wool and cotton the same shade. In regard to Diphenyl Violet R, we will say that this article develops on the fibre very slowly, hence level shades are produced thereby. It is recommended for this reason, especially for mercerized cotton yarn.

The Printing of Tapestry Carpet Yarns.

The method of printing the various colors on tapestry carpet yarn was invented and patented by Richard Whytock, of Edinburgh, in the year 1832. By this method carpets can be made of dyed or colored warps without new blocks being required for each new pattern. The carpets may have a looped surface like the Brussels, or the loops may be cut in the weaving, giving a velvet pile like the Wilton carpets.

Richard Whytock, inventor of the tapestry carpet printing process, was born sometime about the year 1775, and died in 1859.

Whytock's invention shows a sound knowledge of the arts of weaving and dyeing, as well as mathematics.

David Paterson, in writing to one of our foreign exchanges says that after fifteen years, in 1847, fifty-six tapestry looms were working, the greatest number of these being employed in the firm of Henderson & Widnell at Lasswade, near Edinburgh. The great success which has attended the tapestry carpet industry is owing principally to the energetic and enterprising manner in which the eminent carpet firm, Messrs. John Crossley & Sons, of Halifax, entered into its manufacture.

It has now become an important branch of textile industry, extending over the whole world. By employing the same principle of printing and weaving, all kinds of beautiful and inexpensive velvet pile carpets, table covers, sofas, rugs, etc., may be produced at a price within the reach of all. Many improvements in details have, of course, been made on Whytock's invention of 1832; but the principle of imparting to the yarns their

various colors remains practically unaltered. In Brussels carpet manufacture all the yarns are dyed self-colors in the dyebath, each separate thread representing one color in the carpet. In order to have a small piece of a color in a Brussels a thread of that color must traverse the whole pattern. The colors in Brussels are limited to five or six, and if another shade is desired, it can only be inserted by the process of planting, which is substituting it at the desired place for another color already working in the carpet. Whytock's process overcomes this inconvenience.

A single tapestry thread is printed various colors, and there is practically no limit to the variety of shades which can be employed. This, indeed, has been brought forward by some writers as a positive objection to the tapestry process, as the results are apt to become vulgar and "offensive to anyone having artistic taste." But the fault here lies, not in the process itself, but in the taste of the colorist or designer. A soft, harmonious coloring, which would satisfy the most fastidious taste, can be employed with great effect in tapestry carpets. No doubt the coloring in many tapestries is crude and garish, but such are generally intended for foreign export where they have a ready market. With many nations there is a strong demand for bright, showy colors and glaring contrasts, which, to our eye, would appear offensive. This freedom in the employment of colors, then, instead of being a fault in the tapestry process, is indeed a positive advantage, as it enables the manufacturer to supply the demands of other nations, though their taste, perhaps, be not the most cultivated.

Within late years tapestry carpets, as a whole, have greatly improved in coloring; the many excellent productions from our best firms have, no doubt, done much to elevate public taste.

In a Brussels all the dyed threads lie in layers, one on top of another, under the surface of the carpet, and only re-appear on the surface at the certain place where they are required to produce the design. In this way a large amount of dyed yarn must, of necessity, be concealed under the surface. In a Brussels of five colors, or a five-frame carpet, only about one-fifth of the dyed worsted forms the surface of the carpet and is invisible; while, roughly speaking, about four-fifths lies under the surface and is lost to view. By Whytock's process this great loss of valuable material is altogether avoided, all the colored yarn in the tapestry carpet being on the surface and visible.

Another point of advantage is the saving of space with tapestry looms; a Brussels loom occupying three times the space in length that a tapestry one requires. In the early days of Whytock's invention the yarn was wound on the printing drum from bobbins, by rotating the drum by means of a hand crank, while a simple arrangement guided the threads across the breadth of the drum. At that time the colors were applied to the yarn, not by means of a printing pulley and color-box as now employed, but with straight wooden sticks or rulers which were dipped into the color paste and then applied to the yarn across the drum. The edges of the printing sticks were covered with felt. Originally the printing drum seems to have been made of tin and covered over with waterproof cloth. The point at which these color rulers were applied was midway up the drum, where a ledge or guiding-shelf was erected to keep the ruler exactly parallel to the edge of the drum. The introduction of rollers or pulleys running in a small box and color paste, and printing at the bottom of the drum instead of the side, was a great improvement on the old system.

Size.

T. W. Fox writes to the "Textile Recorder," England, on the subject of sizing to the effect that the materials that enter into the composition of size are of vegetable, of animal, and of mineral origin, and they are mainly selected from the following list:

(1) For Imparting the Adhesive Properties—Flour, from wheat, barley, rice, rye, and maize. Starch obtained from the above grains, and in addition from oats, buckwheat, and millet; from seeds, as peas, beans, and lentils; from roots, as potatoes, orchis, tapioca, and arrowroot, and from pith, as sago. From gums, natural and artificial, from glues, and from gelatine.

(2) For Softening the Size and Adding Weight and Fulness to the Yarn—Tallow, of various kinds, chiefly from beef and mutton. Oil, as olive, castor, palm, cocoa-nut, and Shea butter. Wax, as paraffin, bees, and Japan; together with soaps of various kinds.

The foregoing may be considered, in the main, as lubricators, but the following, by extracting moisture from the atmosphere, soften the size and add perceptibly to the weight of the yarn: Chlorides, as magnesium, calcium, and sodium, also glycerine and grape sugar.

(3) For Adding Weight and Bulk to the Yarn—China clay. Sulphates, as baryta, soda, lime, and magnesia. Silicates, as magnesia and soda. Also chloride of barium.

(4) For Preserving the Size and Yarn from Decomposition—Chloride of zinc, cresylic acid, salicylic acid, thymol, and salts of arsenic.

This list by no means exhausts the substances that have been used for sizing, yet it contains nearly all the simple ingredients now in use, as well as many that are seldom employed. In the early days of heavy sizing, everything promising success and many absurd things were tried; the latter, chiefly because sizers were innocent of chemical knowledge. But eventually the least desirable things were set aside, and the process of weeding out is still tending to bring all manufacturers more into line. This, notwithstanding the materials that enter into the composition of size, will probably long continue to vary according to the opinions, or the assumed requirements, of the manufacturer. Certain things, however, are common to all. For example, the yarn must be such as will receive the required amount of size; and since size does not act alike on all cotton, and since one kind of yarn will absorb it easier than another, the need for a careful selection is obvious.

A good, soft-twisted yarn, made from supple fibres of moderate length, is desirable for heavy sizing, as such yarn can be obtained without excessive twisting, and can readily be saturated with size. Long and soft, stiff and short fibres are all difficult to deal with, for a thread made of the first will assume, when sized, a wire-like feel and appearance, and the two latter will require to be twisted so hard in spinning that size will not readily permeate the threads. Hence it is seen that the nature of the fibre, the quantity of twist in, together with the thickness of a thread, all affect the capability of that thread to receive size. Further, the finer a reed in proportion to the warp employed, and the closer and thicker the picks of weft, the greater the amount of stiffening required.

To make a good size, only those ingredients should be used that assimilate well, for substances may be brought together that resist combination, or tend to decompose each other. The ingredients should be added in such proportions, that the size will adhere firmly to the yarn, and not fall away as dust; in other words, the adhesive properties of the size should be good carriers of clay. Size should neither reduce the brilliancy of the dyes nor the whiteness of bleached yarn. The particles must be thoroughly mixed and in a fine state of subdivision. They ought neither to decompose nor mildew, nor otherwise injure the fibres; but rather to render a finished cloth smooth and glossy, and give it a full appearance without being in any way sticky.

Rice or rice water has long been used in India and China for imparting the adhesive properties to size. In the United States of America, and on the Continent of Europe, starch is in almost general use, but in England

wheaten flour holds the first place. The flours used are often obtained from English, Chilian, Egyptian, and Indian wheats. Of these, the first-named flour is considered to be best adapted to the purpose of the sizer. Doubtless all wheaten flour contains similar ingredients, but the proportions of those ingredients differ greatly in grains obtained from different countries, and indeed in those obtained at one time from various parts of the same country, as well as from year to year. This point may be illustrated by citing the results of two examinations of the same description of flour, made respectively in 1875 and 1877. They were conducted in order to determine the percentage of one of the constituents, namely, gluten. It was found that in 1875 the wet percentage varied from 35 to 46, but in 1877 it only reached 28 to 30 per cent.

A grain of wheat contains an immense number of cells, each of which is filled with starch granules. The cell walls are of cellulose—a substance almost universal in plant life—and of gluten. But a careful analysis reveals the presence of many other things.

According to Vogel 100 parts of wheat flour contain—

Starch	68	parts.
Gluten	24	"
Gum, Sugar, etc	5	"
Albumen	1.5	"
	98.5	

Wanklyn gives a more complete analysis, namely:

Water	16.50	
Fats	1.20	Insoluble in water.
Gluten	11.08	
Starch	66.27	
Sugar, gum, and dextrin	3.38	Soluble in water.
Phosphate of Pot sh.	0.44	
Ash	0.26	
	99.08	

Webb has conducted an examination on different lines. He gives the compartive richness in gluten and starch of five different grains as—

	Wheat.	Maize.	Rice.	Rye.	Barley.
Gluten and albumen	19.15	12.3	12.76	9.48	6.24
Starch	65.68	71.0	88.9	61.07	69.50
Fibrine, gum, sugar	14.09	0.4	0.5	3.28	...
Ash	0.70	1.2	0.9	...	...

A claim has been made for flour that it is the basis of all good size for heavy work, and that it probably owes its position to gluten, which is "the nitrogenous substance of the vegetable, which corresponds with and resembles the gelatine or glue of the animal." Others maintain that flour can only be successfully used for sizing after this compound substance has been destroyed, or partially so, by fermentation. Similar differences of opinion exist as to the object of fermentation. While all agree that the process gives a softness to paste, and a smoothness and elasticity to yarn, that flour could not otherwise give, it is held by some that the growth of mildew is thereby prevented, and by others that the object is to improve the color of the size.

Dissimilar as these contentions are, the following points will show that, to a certain extent, all the objects named are capable of simultaneous realization:

The Prevention of Mildew. (1) By steeping flour for a lengthened period the nitrogenous substances are reduced in amount, and, since it is upon these substances that fungi principally feed, it follows that, when fermented size is on the yarn, there is less matter to support such life.

(2) Fermentation produces, amongst other things, "alcohol and compounds which have a powerfully poisonous effect upon fungus or mildew growths;" and these, if allowed to remain in the size, will further retard decomposition. Much, however, depends upon the method of preparing size. Before boiling the fermented flour, many sizers wash it, some from three to five times in clear water. Each time water is added the mixture is thoroughly agitated, and then allowed to remain in a state of rest until the water rises to the top, when it is syphoned off by an adjustable tube. With the water certain acids produced by fermentation, and much soluble matter, including the above-named antiseptics, are removed. In short, the process, if carried far enough, would reduce the flour to starch. The reasons assigned for

washing flour are that it removes free acids which might tender the yarn, and would aid the growth of mildew. But these acids could easily be neutralized by soda ash or milk of lime. Washing also prevents the size from imparting an objectionable smell to the cloth.

Dyeing by Electricity.

A new process of electrical dyeing has been invented. In carrying out the process, the matter to be dyed is subjected to the action of the dye liquor and to a current of electricity, which passes through the same during the operation of dyeing, heating the liquid to the required temperature. The process may be applied to wool, cotton, and other fibrous materials, either in the raw condition or as manufactured or partly manufactured goods. It is also recommended for felt fabrics, hats, fur, leather, horn, bone, etc. The machinery consists, as far as the manipulation of textiles is concerned, of an apparatus fitted with cross-bars for dyeing yarn in skeins, and also of another, supplied with porcelain rollers, for dyeing piece goods. At each end of each apparatus is an immersed electrode, which causes a current of electricity to pass through the contents of the vats.

It is claimed that the electrical current agitates the fibres of the material as well as of the liquor, and thereby causes a rapid absorption of the coloring matter by the fibre, and that the electrolytic action hastens the process of dyeing. The piece goods to be dyed may be plunged into the vat or passed over the rollers, or dipped in any suitable way, and the current may be regulated at will. A direct current of 500 volts and 60 amperes raises the temperature of the water to about 210° Fah. For a tank 6 feet long, 3 feet wide, and one foot deep, a current of 220 volts and 100 amperes is sufficient. For some work, a current of 110 volts and 60 amperes has also been used to advantage. The dye liquor may be heated by any ordinary method, and, when the proper temperature has been attained, the electrical current may be started, which will also keep it at the proper heat. This new process may be applied and installed in dyehouses by simply inserting into the vats the electrodes and other necessary attachments, thereby avoiding any great expense.

The Original Mercerizing Process.

Although first noticed in 1845 or 1846, the mercerizing process was not patented or made public until 1850. It was illustrated at the first International Exhibition in 1851, and proved a very attractive exhibit, being awarded a Council medal. At the close of the exhibition many of the exhibitors desired to present articles to the Queen, but all were declined with two exceptions, one of which was some articles prepared by the mercerizing process. With the public interest thus aroused and stimulated a great and immediate commercial success was anticipated for the process, and it is on record that a French company offered the sum of £40,000 for the patent rights, which was refused. However, on account of the cost of the caustic alkali and the loss entailed by the shrinkage of the material, the process was never, in Mercer's lifetime, of much practical value in dyeing or printing, although it was largely used in a modified form in the preparation of a toughened paper called "vegetable parchment."

—The mercerizing of cotton was somewhat extensively used in France about 1880 for producing crepon effects on silk-cotton material, but fell into disrepute owing to the rotting of the silk which occurs. Within the last few years it has, however, been largely employed for similar styles in wool-cotton cloth, the process being carried out at a low temperature, to reduce the liability of injury to the wool.

QUESTIONS AND ANSWERS.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

Book on Wool and Worsted Carding.

Editor Textile World:

Is there any book published since 1887 on the manufacture of worsted and carded yarns with the rules and calculations of spinning, sorting, scouring, combing, etc.?

Rhode Island. J. W.

There are very few books published on this subject. The best that we know of are the following: Woolen and Worsted Manufacture, by Roberts Beaumont, $2.50; Woolen Spinning, by Charles Vickerman, $1.75; and Spinning Woolen and Worsted, by W. S. B. McLaren, $2. These are all good books and one cannot very well make a mistake if he should secure any one of them.

Bleaching Cotton Goods.

Editor Textile World:

Can you give me any information on the cheapest way of bleaching cotton ribbed underwear and where to purchase material to do the work?

Pennsylvania. W. S. S.

We have answered the above, giving the names of parties that may be of assistance, besides sending some printed matter on the subject.

Pick Glass.

Editor Textile World:

I am an overseer of weaving and frequently have to use a pick glass. Where can I get a half inch glass, and how much will it cost?

We can procure such a glass as you want for you. Cost would be from 50c. to $1.50, according to the pattern and quality of lens.

Llama Wool.

Editor Textile World:

Can you inform us where we can purchase good, long llama wool?

Mich. W. D. R.

We know of no place where llama wool can be obtained, unless lots can be picked up in New York. We doubt, however, if it is to be had in any American market, as there is scarcely any demand for it among our manufacturers. The cost of it, duty paid, would be about 30 cents per pound. If we may be permitted to suggest to our correspondent, we think that his wants might be fulfilled satisfactorily by the use of camel's hair. There is a strong similarity between llama and camel's hair. Both animals from which this fibre is obtained belong to the camel family.

A Dyer Wants Help.

Editor Textile World:

Will you please send me a formula for using indigo or a chemic blue on wool. I have seen aniline blues, but want a genuine indigo. I also want to inquire if there is anything that can be put in the dye with ..... Black, when coloring garments, to keep the color from going on to the cotton goods. I have tried everything I know of, and cannot succeed to my satisfaction. This may seem strange. I can work logwood so that the cotton is nearly white.

Missouri. Kirk.

We have replied by mail.

Book on Chemistry.

Editor Textile World:

Will you let me know where I can obtain Comstock's book on Chemistry?

Conn. A. S.

This book is published by Sheldon & Co., 8 Murray St., New York, who can undoubtedly supply the demands for it.

Cement for Leather and Iron.

Editor Textile World:

I want a cement that will cause leather to adhere to iron, so as to stand a heavy pressure and strain. Can you inform me how to make a cement that will answer this purpose, or tell me where I can obtain it already manufactured?

Penn. J. A. T.

We think that it would be difficult to obtain a cement that would be satisfactory for this purpose. We have sent samples of cements with which experiments may be made.

Crude Asbestos.

Editor Textile World:

Will you be so kind as to give me the address of a firm who deals in crude asbestos?

N. Y. P. H. K.

We would suggest addressing this inquiry to the H. W. Johns Mfg. Co., 100 William St., New York City.

Wants Shoddy Machinery.

Editor Textile World:

I desire to embark in the shoddy manufacturing business, and desire to obtain information as to the chances of marketing shoddy from this section, with prices at which it could be sold. What are the kinds of machinery and appliances required to manufacture shoddy? What are the names of woolen mills in Minnesota, Wisconsin, Iowa and Illinois which would be likely to want shoddy?

State of Washington. N. C.

We would suggest to our correspondent to consult the Textile World's Directory for 1898, which will give him the best information that he can obtain regarding the names of woolen mills in the states that he mentions, which would be likely to use shoddy. He can judge of these by the character of goods that they manufacture; but it would not be a great undertaking if he should write to all of the mills and ascertain from direct sources. He can obtain by the same method the probabilities of marketing the product at a fair price. This is really the only satisfactory course for him to pursue. In regard to the amount of machinery necessary for the manufacture of shoddy, we would advise his addressing parties who advertise in our columns. Roughly speaking, we should say that a shoddy picker and a card, with possibly a lumper and duster, would answer his purpose.

Book on Sizing.

Editor Textile World:

Can you give me the name of any modern work on finishing cotton? I want a book that treats of filling goods and sizing and starching the same.

H. F.

We would suggest getting the recent work by Hugh Monie, Jr., on "Sizing Ingredients, Size Mixing and Sizing," published in England. Sixty-three pages, illustrated. Price $1. We will obtain it, if desired. This book is intended to be a complete practical work dealing with everything relating to the modern processes of sizing, and takes up such subjects as sizing ingredients (flours, softeners, deliquescent substances); Size preparations (Chloride of Zinc, Whitening material, Percentage of size, etc.); Fermentation; Mixing; Construction of Sizing Machine; Working of the Machine; Definition of Technical Terms; Calculation, etc.

Machinery Wanted for Bags.

Editor Textile World:

I want information of the machinery necessary for making 500 bags per year, for cacao, coffee and sugar, including machinery to work the Henaquen fibre. Can you tell me of whom I can obtain this machinery?

New York. G. L. S.

Ring and Lap Waste.

Editor Textile World:

I notice in your article on "The Wool Tariff," that you have given a clear definition of ring waste, but you say nothing about lap waste. This term, I believe, is used in the trade, and I should like to have your definition of it.

R. I. C. F.

We have already given what we believe to be a correct definition of ring waste, but we will say in addition that this waste is made on the roller, when an end breaks down in mule spinning, and the soft part of the roving accumulates around the roller until the operative can go to it and piece it up. When piecing up the end, he slips the waste off the end of the roller, and it forms a ring, and is called ring waste. Lap waste is made on the English spinning frame, but as the roller on this frame is four inches in diameter, the spinner, in taking it off, breaks it instead of slipping it off, and it is then straightened into what is called a lap. The quality and value of these two wastes is the same, only one is called ring waste, which comes from the worsted mule, and the other lap waste that comes from the English spinning frame.

Angora Rabbit Fur.

Editor Textile World:

I am trying to learn a few facts in regard to the production of yarn from the fur of the Angora rabbit. I have been referred to you as a reliable source of information on this subject. I should like to know how the hair is obtained from the animal, if cut or combed off. Next, what is considered a fair yield. I have been experimenting with some of the rabbits, with encouraging results, but have been working altogether without a knowledge of the proper method.

Iowa. J. M. H.

We do not know of any Angora rabbit, and, therefore, presume that our correspondent refers to what is known in the trade as "shocks," probably a cross between a rabbit and a hare. There are not very many of these, but they have a long woolly coat, and can be doubtless converted into yarn. The fur is cut off the skin. Ordinary rabbits are bought during the winter season in England and on the Continent, London being the centre for the former and Leipsic and Paris centres for the Continent. Australian skins are sold at regular intervals in the commercial sale rooms, the next sale being on Nov. 11th. Concerning the production of yarn for weaving purposes, we doubt if it would be anything like as cheap as wool, in fact see no advantage in it and owing to its short staple would not spin any-

thing like as well as either cotton or wool. The staple on an ordinary rabbit is about ⅝ to ⅞ inch, at the very outside.

Mercerized Cotton.

Editor Textile World:

I have been experimenting with mercerized cotton, but have been unable to get the desired result. In my experiments I used skeins stretched on a frame, under considerable tension. The yarn was first boiled, then immersed in a solution of caustic soda, 50 to 60° Tw.; then washed and put in a bath slightly acidulated, all under tension. I am able to get some lustre, but not equal to samples I have seen, nor am I able to get that soft, silky feel. Can you tell me why I fail?

Mass. M. G. W.

We fear that we cannot give our correspondent information of any practical value to him, nor can we see how any one can afford him relief, unless he went to his mill and watched his processes from beginning to end. Those who have attempted the mercerization of cotton yarn bear testimony that better results can be obtained by stretching in the chain, than in the skein. In order to secure a lustre, the tension should be comparatively severe, enough, at any rate, to prevent any shrinkage. The temperature of our correspondent's caustic soda, we should judge, is about right, as agreeing with the best formula that we have come across. Without exactly knowing, we will venture the opinion that the difficulty lies in the stretching, or in the temperature of his solutions. The addition of zinc oxide to the caustic soda solution greatly increases the action of the latter, so that caustic liquor too dilute to be effective, when used alone (20° Tw.) is rendered as active as the much stronger (40° Tw.) solution when zinc oxide is added. We give this last observation on the strength of an English authority of high repute. We have our own theory, as we have privately expressed to our correspondent, regarding the true cause of the lustrous effect on yarn, but we have not demonstrated its accuracy to our own satisfaction, but hope to do so in time, as the result of some scientific experiments.

Electric Lighting.

Editor Textile World:

I am running a 60 h. p. 500 volt, direct current dynamo, furnishing power. The machine is only about half loaded so that we have 30 h. p. to spare. The shop is wired for 130 16 c. p. lights which are operated at present from a 2,000 volt alternating current system. Can we light our shop from one machine without changing wires and lamps?

Easthampton, Conn. F. W. H.

The only way in which you can operate the present system of wiring on the 500 volt machine would be to connect the lamps 5 in series and connect this group to the mains the same as one lamp is connected now. The insurance rules would prohibit you doing this, however, as with circuits carrying 500 volts and over the wires must be separated, at least 5 inches.

Starting an Injector.

Editor Textile World:

How would you start an injector if the check valve was leaking, without shutting down, the water being low in the boiler?

Hyde Park, Mass. A Sub.

If there was a stop valve between inspirator and boiler, the feed could be started by means of this valve. In locomotive type of inspirators there is sometimes a check valve in the discharge of the inspirator. In the absence of a stop valve and failure of the check, the inspirator will be hot but may be cooled if hose and water pressure are available. When cooled sufficiently it is possible to start same under these conditions.

Steam and Mud Drums.

Editor Textile World:

Please give rule for the proper proportion of steam and mud drums and size of connections for same.

Cincinatti, Ohio. O. H.

The use of steam drums and mud pots on fire tubular boilers is regarded by boiler insurance authorities as a useless and dangerous practice which is becoming obsolete, as modern construction will show.

Lights Go Out.

Editor Textile World:

A plant having 100 to 200 lights in it, is started up. Lights put on about 7.00 or 7.30 P. M.; they will burn beautifully for a while when without any warning go entirely out. Can you give me a reason for such action, that it may be rectified, as it is a source of great annoyance and a puzzle to myself.

Charleston, S. C. P. A. H.

From the description which you gave us as the difficulty with the dynamo it is quite evident that a loose connection of some kind developed shortly after running your machine.

This is very likely caused by heat generation at the commutator. This heat very likely has a tendency to cause an open circuit. Would suggest your taking current from some immediate source such as magneto and testing up all circuits in the machine as well as on the switchboard, and possibly will discover an open circuit. The chances are this will be found either in the armature or the field windings.

New Publications.

Efficient Power Pumps. The Goulds Manufacturing Co., 16 Murray St., New York, have just issued a partial catalogue of their power pumps, under the foregoing title. These pumps have met with excellent success wherever they have been used. The economy of power pumps is a recognized factor in industrial operations, and is dependent upon the economy of the motive power of the plant. A complete catalogue of Goulds' pumps is sent upon request. The present one is illustrated with triplex power pumps, boiler feed pumps, medium and low service triplex power pumps, double acting triplex pumps, and others.

Fashionable Shades. This is the title of a color card issued by William J. Matheson & Co., 182 Front St., New York, showing a number of shades dyed with easily leveling dyestuffs, which we would suggest dyers to obtain, as they can do by writing to this house.

Color Card. The Farbenfabriken of Elberfeld Co., New York, have issued cards of dyed shades on chip plait and Japanese straw, showing the latest fashionable colors, which should prove interesting to those desiring to color such material. These pattern cards will be sent to dyers upon application.

Cotton Movement and Fluctuations. New York: Alexander, Latham & Co. We are in receipt of this annual, covering the period of 1893 to 1898, gotten up in its usual form of typographical elegance, giving a large amount of useful statistics relating to the cotton trade. An excellent article appears in it, on "The Cotton Industry of Japan," written expressly for this edition, by the distinguished statistician, Thomas Ellison, Liverpool. Illustrations and a description of the Lowry cotton press, also appear, which was conspicuously illustrated in our July issue. This publication is issued for gratuitous distribution among the friends and customers of the publishers, and is not for sale.

Quarterly Journal of Economics, for October, 1898. Boston: George H. Ellis. This issue is the first number of volume 13, of this quarterly, published for Harvard University. As usual, it contains a number of articles of great economic merit, and we take pleasure in referring particularly to the following: The Future of Economic Theory; The Gas Supply of Boston; The Educational Aspects of Saving; A Connecticut Land Bank of the Eighteenth Century; Levasseur's "L'ouvrier Americain."

Shades fast to milling, on wool. This is the title of a color card issued by Wm. J. Matheson & Co., New York, which dyers should be interested in, and no doubt their wants would be readily met should they write to the above house for a copy. The colors presented appear in felts, and furnish a most attractive line of colors, with a great variety of shades.

Diamine Dyes. William J. Matheson & Co., New York, have recently issued a circular with sample dyeings from Diamine Rose G D and B G, which produce somewhat yellower shades than the old marks. Attention is especially drawn to their fastness to light and brightness of shades. Their sample card of Diamine Black R M W is made up of low grade woolen samples, containing many burls, which are dyed without rinsing, simply squeezed, after having been dyed. Good results are obtained with this dye in covering all vegetable matter. Dyers would do well to send for them.

The Empire of the South. This is the title of an exceedingly attractive book, published by the Southern Railway, headquarters at Washington, D. C., for the purpose of describing and illustrating the resources, industries, places of resort, in all sections traversed by this line of railway. It is the handsomest publication of its kind that we have seen for a long time. The paper upon which it is printed, its typography, and illustrations cannot be readily excelled. It is divided into chapters relating to the South, fully illustrated: Yesterday, Today and Tomorrow; Washington; Virginia; North Carolina; South Carolina; Georgia; Tennessee; Alabama; Kentucky; Mississippi; Louisiana; Florida.

Egyptian Cotton, Fluctuation in Prices, 1891-1898. Stoddard, Haserick, Richards & Co., 152 Congress St., Boston, Mass., importers of Egyptian cotton, have just issued a very attractive and convenient card showing by diagram, in colors, fluctuation in prices of Egyptian cotton during the years of 1891 to 1898.

The Prang Standard of Color. Published by Louis Prang, Boston, Mass. This is a work that comes to us in folio form, and one that designers who make use of colors would greatly appreciate and find of much assistance. Mr. Prang's works are known most favorably, not only throughout this country, but in Europe. This particular work does not seek to advance any theories as to color, and is restricted to colors of pigment, rather than to the spectrum. The intention of this work is to establish standards of colors by a systematic arrangement of them into scales or series, so that while the interval between each color is distinct, there is a sense of one melting into the other, and reveals how carefully the presentation has been made.

Silk Dyeing, and Discharges on Developed Paranitraniline Red. Two sample cards in pamphlet form, relating to these two subjects, have reached us, from Wm. J. Matheson & Co., New York. Silk Dyeing relates especially to the production of shades fast to bleeding in water and to milling. Paranitraniline may be used with any dischargable diamine colors, by certain additions. With the new discharge, white and colored effects can also be obtained on dyeings, produced with well known combinations.

Chemical Jurisprudence. By Harwood Huntington. Published by the author, 260 West Broadway, New York City. Price 25c. This is a pamphlet of 23 pages, of much value, consisting of notes on chemical jurisprudence, being a digest of patent-law cases involving chemistry. The author is well known to the textile industry; is a member of the Hartford (Conn.) Bar; and chemical expert.

Water Wheel Governor. The Lombard Water Wheel Governor Co., Boston, Mass., has just issued an illustrated catalogue relating to their water wheel governor. This catalogue contains among other illustrations, some interesting ones showing speed diagrams of a degree of regulation which this company's regulators have produced under various conditions in actual practice. This company manufactures for all makes of turbine and impulse water wheels, and for large steam engines.

Appleton's Popular Science Monthly, for November, New York: D. Appleton & Co. Price $5 per year. This monthly has in its November issue, several valuable articles of popular interest. The leading article is the Discussion of the Origin of Peoples Which Settled Middle America. Prof. C. R. Dodge, of the Bureau of Agriculture, Washington, has an article in this number, on The Possible Fibre Industries of the United States. The Torrents of Switzerland, is the title of an interesting paper, giving an account of the engineering problems and the way that they have been solved, which have presented themselves in the necessity for controlling the turbulent streams of that mountainous country. One of the illustrated papers that appears, relates to the Architectural Forms of Nature, showing the strange contours and striking resemblances to the works of man, which the forces of nature have frequently produced.

Harmonic and Keyboard Designing. By C. H. Wilkinson, London: L. Upton Gill. Over 250 handsomely worked out designs, suited to numberless manufacturers. An early method of producing an endless variety of most beautiful designs by unskilled persons from any piece of music. This book is not put before the public as a book of designs merely, but as a work introducing an entirely new method by which any individual may become familiar with a ready system of transporting music into design. The author has invented a system that is unique and original, based on the analogy which exists between the laws of harmony in sound and those of color and form, and that as in color, there are the three primaries, red, yellow and blue; so in acoustics there are three original and primitive sounds, the tonic, mediant and dominant; and in form three grand primary elements, the circle, the triangle and the square. The work, for example, treats of harmonic stripes, hair lines, space checks, hairline checks, square designs, ornamental designs, floral designs, etc.

Industrial News.

—H. D. Martin, late general superintendent of the eastern mills of the Dominion Cotton Mills Co., who recently resigned his position there, has gone to Nashville, Tenn. The Tennessee Manufacturing Co., of which he will be superintendent, is a large concern, employing some hundreds of hands. We congratulate our friend on his appointment. Since coming to Windsor, N. S., Mr. Martin has made a number of improvements in the mills, and done a great deal of repairing, leaving the factory in a much better condition than when he came. His relations with the hands have always been of the kindliest, and every one of them will wish him success in his new position. Mr. Martin stands high in the estimation of cotton mill men in the United States; is a member of the N. E. Cotton Mfg. Association, and holds several valuable patents on cotton machinery. Deeply interested in church work, Mr. Martin gave a great deal of his spare time to religious work, among other things acting as superintendent of the Plains Sabbath School since the resignation of Mr. Nalder. The Tribune joins his other friends in wishing him the best of good fortune.

—James Taylor, whose office and showrooms are at No. 835 Arch St., Philadelphia, has a large and very complete knitting machinery depot, where can be purchased everything that is necessary in the equipment of a hosiery or underwear factory. Besides handling some of the best new machines, he has a large stock of second hand machinery which he is quoting at very low prices. At present he has for sale among other machinery, several sets of cards and mules. Specialties are underwear machinery, stocking machinery, steam presses, drying machines, nappers, loopers, ribbers, winders and brushers.

—The American Correspondence School of Textiles at Lowell, Mass., is meeting with very considerable success and is apparently supplying a long felt want, especially in the more remote sections of the country where textile manufacturing is conducted. The applications for enrollment, especially in the cotton department are very numerous, probably because this is under the direct charge of the director, Professor C. P. Brooks, who has prepared a catalogue which will be mailed on application.

—The citizens of Paducah, Ky., have just organized the Commercial & Manufacturers' Association of Paducah, the object being to put before the manufacturers of the country the advantages possessed by that enterprising place. There are already a number of flourishing industries there, among which, in the textile line, is the Cohankus Mfg. Co., formerly of Hohokus.

—New York, New York. Further particulars in regard to the officers of the American Thread Co., are at hand, as follows: president, Lyman R. Hopkins of the Merrick Company; vice-president, Alexander King of the Barstow Thread Co.; treasurer, Theodore M. Ives of the Willimantic Company. These officers will be assisted by Algernon Dewhurst, W. M. Manlove, and J. E. Lawton, managing directors of the English Sewing Cotton Company. This company has subscribed $3,600,000 to the common stock of the American Thread Company.

—The Berlin Iron Bridge Co., East Berlin, Conn., are furnishing steel work for the following concerns: The steel roof for one of the storehouses of Laflin & Rand Powder Co., Pompton, N. J., the roof trusses of which are steel; a new steel riveted lattice bridge for the Utica Belt Line Railroad Co., Utica, N. Y.; a new iron bridge for the town of Somerville, N. J., having a span of 60 feet, and a clear roadway of 14 feet; the steel roof work of the additional buildings now being erected by Holmes, Booth & Haydens, Waterbury, Conn.; the steel framework, with corrugated iron and steel purlins for the sides for the new foundry extension for the Benjamin Atha & Illingworth Co., Harrison, N. J.

—The Brown & Sharpe Manufacturing Co., of Providence, R. I., recently installed a Rice & Sargent cross-compound condensing engine of 350 indicated horsepower in the main machine shop. The new engine takes the place of a pair of non-condensing simple engines of the Corliss type. One of these engines was built in 1872. The change will effect a saving of ten tons of coal a week. The gain in economy illustrates the great advance made in steam engineering during the past 20 years.

—M. Cokeley, who is probably known to many of our readers, has been made superintendent of the works of the C. W. Hunt Co., Staten Island, N. Y., assuming the duties of that position Oct. 14th after several months' work revising the factory systems. Large concerns are beginning

to relieve the office management of providing the details in office routine, the installation of systems, methods, etc. This work properly belongs to a specialist; one who constantly keeps his eyes open for improvement, studying the best literature on the subject and devoting his energy entirely to this work. Mr. Cokeley had made this special work his profession for some time, being for many years with the General Electric Co., and later with other prominent establishments. His experience as a practical mechanic has been of great benefit in his line of work, enabling him to detect almost instantly the leaks that invariably exist and which are so destructive to profits.

—The Philadelphia Textile School opened its day classes on Sept. 26, and its night classes on Oct. 3. The attendance is by far the largest in the history of the institution.

—The Paragon Mills, Cedartown, Ga., are nearing completion and will soon commence to install their new machinery which consists of 5,000 Asa Lee mule spindles, and all preparation machinery, viz., pickers, cards, drawing, slubbing, intermediate and roving frames. The Kinston Cotton Mills, N. C., will soon start up their new equipment consisting of 3,000 spindles and all preparation machinery. The Acushnet Mills, New Bedford, Mass., have recently placed a large order for cards and drawing. All of the above machinery comes from the works of the Howard & Bullough American Machine Co., Pawtucket, R. I.

A Point for Manufacturers.

It has always been a surprise to us that more textile manufacturers do not avail themselves of the facilities which are at hand for obtaining more satisfactory results in their dyeing. To bleachers, of course, the character of the water used is of the utmost consequence. It is really none the less so to any dye house, especially those coloring delicate shades. We presume it may be that unsatisfactory experiences have been met with filtration. Since the re-organization of the New York Filter Mfg. Co., embodying the best systems of mechanical filtration, constructed under patents granted to the leaders in this line, there is no difficulty in getting a good filter system. The following letter recently received from a large woolen manufacturer, shows how advantageous its use may prove to be, and suggests an improvement which we fear many manufacturers do not realize is within their reach.

Geo. C. Hetzel & Co., Manufacturers of Worsted and Woolens.
Chester, Pa., Nov. 2, 1898.
New York Filter Mfg. Co.,

Gentlemen: Replying to your favor of the 1st inst., we are pleased to inform you that the Morrison Jewell Gravity Filter we have in use has given us satisfaction in every particular. We have spent a great deal of money in experimenting with filtration and not until we adopted yours did we get any results that were of value. We pump the water direct from the Delaware River and the condition of the water is so variable, that it has always been impossible for us to count with any certainty upon duplicating shades in our dyeing, but the water passed by the filter, now being always the same, enables our dyer to get first class results at all times, and we would not be without it for many times its cost.

Yours truly,
Geo. C. Hetzel & Co.

—The Mutual Boiler Insurance Company have issued under their circular No. 7, a very complete report on the weathering of Bituminous coal, in which all the facts are given. The changes effected in the coal, either by exposure to the weather without shelter, or by covering the coal, are all stated in full. A copy of the report may be obtained at the company's office, 31 Milk St., Boston.

C. Bischoff & Co., well-known dyestuff manufacturers, removed their Boston branch office to 124-126 Purchase St. on Nov. 1st. A. S. Mawson is the enterprising manager. Telephone number is 3784.

The New Excelsior 7-8 Automatic Knitter.

The Excelsior Knitting Machine Mfg. Co., whose 1897 three-quarter automatic knitter was so well received by the trade, have still further developed their machine and are now putting out a new model which is nearly full automatic and which they call a seven-eighths automatic knitter. It has some features which are of decided interest and value, and which may well merit the attention of the trade, which, by the keen competition and marked improvement in this line of machinery in the past few years, has been educated to the point of very critical consideration of everything new in the line of hosiery knitting machinery.

In the new seven-eighths model, when the cylinder is placed in the machine and the desired length of stocking made, it stops for the heel. The operator then splices in the extra thread, starts the machine on the reverse motion and after the heel is made, the machinery automatically cuts out the splicing thread, makes all the other necessary changes, and proceeds on the circular work until the toe is reached. By these improvements, it will be seen that the machine makes two stops less in the manufacture of the stocking, which it is claimed enables one operator to run four machines on half-hose instead of two. This is a point well worth considering.

The Excelsior Knitting Machine Mfg. Co. are now established in their new works at Allentown, Pa., on Meadow and Washington Sts., built exclusively for their purposes, and containing every facility for economically turning out the various types of Excelsior knitting machines in the most perfect manner. They invite correspondence from manufacturers in relation to their new seven-eighths machine.

Mechanics' Fair.

The Mechanics' Fair, that is now open in Boston, is an event of great interest to New Englanders, as presenting many unusually attractive and interesting features. It is unique in many important details, and marks an era in industrial expositions, as being the first in the world's history with electricity as the exclusive motive power. Wireless telegraphy, about which the whole world is talking, has received here its first public demonstration in New England. In addition to the transmission of signals and messages, a new apparatus is used for the explosion of submarine mines in an artificial lake, a miniature warship being torn asunder and fragments being thrown high in the air. Moor's vacuum tube light, artificial day light, as it is termed, is an object of much interest. The color of the light is

such that it is invisible in the daytime, proving the similarity to daylight, and snap-shot photographs can be taken as well by this light as by daylight. A very popular feature connected with the Fair is the exhibition that is given, at stated times during the day and evening, by B. F. Keith, proprietor of well known theatres in Boston, New York and Philadelphia. Among the novel attractions may be mentioned the Japanese Tea Garden, which is a delightful innovation. Another attraction is an oriental smoking room, furnished in the most complete oriental style. Other things are to be seen at the Fair that are instructive to those of all ages.

An Outing that is Exciting and Healthful.

That Maine is the greatest paradise for those of sporting inclination was long since granted, but to the average New Englander the Sportsman's Show in Boston last spring was an eye opener. Hundreds who visited this marvelous exhibition declared that this fall they should participate in this, the most fascinating sport; and that the promises are being made good is already evidenced by the great travel toward the Maine hunting grounds. On every east-bound train will be found great quantities of trappings and outfits of the huntsmen, while the sportsmen talk over and dream of the excitement incident to the deer hunt. Many are the city men now-a-days who are enjoying a palatable spread of venison, the result of the good luck of some friend; but to be able to participate in the chase of a deer or moose is an enjoyment that is finely described in a recent article in "Outing," which reads like this:—

"It was a delightful November afternoon, and the air was just invigorating enough to make one feel happy and full of life.

"It was to a barren opening about a mile from our camp that we were bound, and to reach it we were obliged to pass a small lake, when, suddenly, we saw on the shore, opposite, a great bull moose. Our guide quickly made preparations to call. The old fellow at the first challenge showed in every move that he was ready and willing to fight, and immediately started in our direction. To see that great angered beast tearing through the underbrush, bellowing as only an infuriated animal can, was a most thrilling and exciting experience.

"When within a short distance from us he stopped. Tossing his head high in the air he pawed the earth,—his every manner was that of the "King of the Woods," that he is. We still remained under cover, and fearing that he might start in another direction we discussed in a hurried manner the advisability of another call. If successfully given, all well and good; if there happened to be the slightest flaw the chances were fatal. The call was given, and that it was rightly given we soon discovered, for toward us he came, and in less time than it takes to tell it he appeared before us, his magnificent antlers raised aloft over his massive head. His eyes large and red showed that he meant business, while his mane stood erect and bristling. Shoot! they cried, and with as much calmness as my condition permitted I raised my gun and let her go. I was blinded by the smoke, but from the tearing about that was going on I knew that I had brought him down."

This experience is not exceptional, but a regular and oft-repeated occurrence, and one in which you would delight.

The Boston & Maine, R. R., and its connections pervades every part of this resourceful country, and its trains are run at convenient hours; and in the parlor sleeping-car service that is in effect, you can go there in luxury and comfort.

If you want to know of the hunting regions of Maine, send a two-cent stamp to the General Passenger Agent, B. & M. R. R,. Boston, for the book entitled Fishing and Hunting, which is profusely illustrated.

Krout & Fite Mfg. Co.

We would call attention to the Krout & Fite Mfg. Co. (whose advertisement appears on another page of this magazine) formerly located at 2632-40 Mascher St., Philadelphia, but from the rapid increase of their business and the demand for their products, were compelled to seek larger quarters, and are now located in their new factory, Allegheny Ave. and Emerald St., where they have increased facilities for turning out their products.

They opened their new factory the early part of October, with very pretentious ceremonies and a flag raising. The ceremonies were opened by an address by the Rev. Dr. Thomas of the Fifth Baptist church. A large party of invited guests, together with the employees of the company, gathered on the roof of the building where the flag was unfurled to the breeze, sending showers of miniature flags into the crowd. A salute from twenty-one guns was fired as the flag unfurled.

Following the flag raising, there was an elaborate luncheon, at which addresses were made by a number present.

This enterprise was established ten years ago by Geo. W. Krout and John E. Fite, at 2815 American St. Through their efforts they built up a business which in a few years' time required them to seek larger quarters. They selected a building at 2632-40 Mascher St., where their business continued to increase. In 1893 the extensive accumulated interests of the concern were re-organized and incorporated with a capital stock of $50,000, and an executive consisting of Geo. W. Krout, president; John E. Fite, secretary and treasurer; and Jules Bloch, manager. Increasing trade still demanded greater facilities and in May, 1898, the company contracted with Alfred J. Rust to build them a new mill at Allegheny Ave. and Emerald St., where they are now located. Their business is that of manufacturers of lace edgings, spool tapes, and narrow silk and cotton fabrics, and they are celebrated for the superior character of their product, which is in constant demand with the trade.

The premises now occupied comprise three floors, 45 by 200 ft., and are in every way adapted to the requirements of the business and completely equipped with the latest improved machinery and skilled operators. The hands are afforded constant employment and the trade controlled by the company is one of large and annually increasing volume broadly distributed throughout the United States.

A New Striper.

We have recently seen several new striping attachments for spring needle machinery and one which handles five colors successfully and automatically, seems to present features of unusual merit. The difficulty of striping attachments has been that they are so delicately constructed and require such fine adjustment, that they do not stand mill

usage under ordinary conditions. The inventor of this five color striper has hit upon a most ingenious method of feeding the yarn onto the wheel, and cutting it out, which does away with all finely adjusted grips, tensions, etc. During the twenty minutes or half an hour that we watched the machine in operation, there were no tight stitches at the splicings and no more imperfections in the work than with ordinary single color knitting. This attachment was applied to a 4½" head, which is as small as would ever be called for on this class of work, and the larger the head the more easily it can be adjusted. We understand that several prominent mills have inspected this striper and that several trial orders have been placed. The inventor has not yet decided whether to put the machine on the market himself or to sell his patents.

In Rhode Island.

The mills in Burrillville, R. I. are getting a fair share of business, and most of them are running, although not all, on full time. A great many cotton worsteds are being made in this section.

Around Pascoag, the mills are getting out their heavy weight samples.

The Glendale Woolen Co. shut down Oct. 22nd for two weeks.

The mills at Oakland and Mohegan, operated by the Wanskuck Co., are running full time on white worsteds for men's wear.

Tinkham's mill, at Harrisville, is running full time on cotton worsteds.

At Plainville, only the pattern loom and one set of cards were running when our representative called.

At Mapleville, repairs are being made ready to start up in the near future by the new purchasers.

On the Pacific Coast.

A subscriber writes us that business is very dull in that section. The San Jose mill is shut down, also the mill at Bandon, and most of the other mills are running about half capacity, with the exception of the Golden Gate, which has a large government contract for 22-oz. kerseys, and will be very busy for some time.

Oilless Bearings.

The Ameledema Oilless Bearings, which are advertised elsewhere in this issue, manufactured by the Ameledema Oilless Bearing Co., Ltd., Wayne Junction, Pa., are meeting with marked success and giving satisfaction wherever used. These bearings are made of wood that has been chemically treated, and are particularly recommended where absolute cleanliness is of any importance. The bearings require no oil or other lubricant, and demand no attention, being especially applicable to light or high speed machinery, as found in many of the machines in textile mills, as the mule, spinning frame, etc. The following parties, among many others, are using these bearings: The J. B. Stetson Co., Philadelphia; Rainbow Knitting Mills, Philadelphia; Morse, Williams & Co., Philadelphia; Camden Curtain & Embroidery Co., Camden, N. J.; Boston Mfg. Co., Waltham, Mass.; Watson Mfg. Co., Leicester, Mass.; Crawford Laundry Machine Co., Boston.

—H. M. Wesson & Co., New Haven, Conn., are meeting with most satisfactory success in the disposal of their belt hooks made under the Wilson patent. These hooks are self-clinching, and are made from the finest quality of malleable iron, warranted tough and pliable, and to stand the most severe test. These hooks are well known to manufacturers, having been on the market for a great many years, and no complaints have been made of their breaking. We would suggest manufacturers writing to the above concern for circulars, etc., descriptive of the hook. A sample will be sent free on application.

—S. Y. McDonald is loom fixer at the Keyser Woolen Mills, Keyser, W. Va. We erroneously reported D. W. McAllister as holding that position, in our last month's issue.

Recent Sales of Mill Shares.

	Lowest.	Highest.
Barnard	65	65
Border City	100	102
Sagamore	80	85
Stafford	90	90
Stark	855	855
Amory	121¾	122
Boston	460	460
Lancaster	312½	315
Jackson	915	915
Amoskeag	1412½	1420
Cocheco	167½	167½
Manchester	97¾	99¾
Merrimack	905	910
Lyman	49½	52½
Assabet	50⅛	50⅛
Appleton	100⅛	101⅛
Middlesex	120	120
Fremont & Suffolk	125¼	125¼
Grinnell	142½	142½
Arlington	100	104¼
Hamilton	622½	622½
Thorndike	1000	1000
York	600	615
Lowell	495	500
Chicopee	49¾	49¾
Naumkeag	44¾	48
Davol	90	90
Continental	14	15
Franklin	99⅞	100
Everett	60¼	62½
Lawrence	102¼	104¼
Pacific	1900	1900
Union	130	130
Great Falls	142¼	143¼
Massachusetts	79	79

Facts and Gossip.

—Massachusetts, New Bedford. Contract has been awarded for the erection of the building for the New Bedford Textile School. The main building will be 644 by 112 feet, brick, three stories high and will cost about $180,000.

—Massachusetts, Oakdale. It is reported that there is a likelihood of the West Boylston Mfg. Co's going out of business, owing to the unsatisfactory condition of the cotton trade. In any case, the mills must be removed by July 1st, 1900, the Metropolitan Water Commission having taken possession of the land upon which the mills stand.

—Rhode Island, Wyoming. It is reported that the old batting mill, the property of F. C. McCormack, of New York, will be sold or leased to a concern for the purpose of manufacturing silk, or silk velvets. Charles C. Howe, who is seemingly interested in the matter, reports that he has practically received a confirmation of this rumor from Mr. McCormack.

MILL NEWS.

Cotton.

New Mills.

—*Alabama, Alabama City. Work on the new cotton mill for the Dwight Mfg. Co. is being rushed as rapidly as possible. The excavations are now being made for the mill proper and the warehouse. As the Dwight Co. could not get a contract as reasonable as they wanted, they are erecting the buildings themselves. R. A. Mitchell, agent of the company, is overseeing the work.

—Alabama, Florence. The report that F. M. Perry a local business man, will erecty a cotton mill at this place is being revived. We announced this mill last March, but the rumor received no confirmation at the time. It is stated that Mr. Perry has announced his intention of installing an electric lighting and power plant in addition to his cotton mill, and will contract for lighting the town of Florence.

—Florida, Monticello. A small mill is talked of at this place by E. B. Bailey and others. Mr. Bailey wishes to receive estimates on the cost of the erection and equipment of the mill. It will probably be of about 3,000 spindles.

—*Georgia, Cedartown. The new Paragon Mills' main building is now completed, and the installation of machinery will begin next month. Most of the machinery needed has already been ordered.

—*Georgia, Forsyth. The Forsyth Mfg. Co. inform us that the new mill will begin production about the 1st of November. The old machinery will be moved out of the present mill building into the new one, which will have double the capactiy, bringing the total up to 5804 spindles. They will manufacture carpet warps and hosiery yarns; steam power. J. M. Ponder is president, J. H. Kane superintendent.

—Georgia, Harmony Grove. It is reported that work will be commenced next spring on the erection of the large cotton mill projected by G. W. D. Harber. The mill will have about 5,000 spindles and 200 looms. The production will be sheetings and drills.

—*Georgia, Lindale. Ground has been broken for the new mill of the Massachusetts Cotton Mills at this place, which is to be erected at a cost of $600,000, and will contain about 30,000 spindles.

—Mexico, City of Mexico. Col. Girardo Amilio Herrera is about to erect a linen factory in the State of Tlaxcala.

—*North Carolina, Kingston. The new Kingston cotton mills here, which were incorporated Feb. 3, will soon start up 3,500 spindles.

—North Carolina, Norwood. A contract for the machinery of the 5000 spindle mill, now building at this place, was last week awarded to the Charlotte (N. C.) Machine Co.

—Rhode Island, Lincoln. Articles of incorporation have been filed of the L. A. Lockwood Co. This company will engage in the manufacture and sale of cotton cloth. The incorporators are Lawrence A. Lockwood, Chas. C. Burnham and Chas. F. Burnham. Capital stock, $100,000.

—*South Carolina, Lando. The contract for the buildings to replace the Manetta Mills, owned by B. H. Heath of Charlotte, N. C., which were burned recently, has been awarded to J. B. Smith. The new mills will have a capacity of 7000 spindles.

—*South Carolina, McColl. On Oct. 24, articles of incorporation were granted the new company, previously mentioned, with the following named as incorporators: T. B. Gibson, F. P. Tatum, Charles Iceman, A. W. Morrison. A permanent organization of the company will be effected in a few days and officers chosen, who will let contracts for both buildings and machinery, and, probably, electric light equipment. The initial capital stock is placed at $50,000, which will probably be increased later on. This is the project we mentioned last March as being contemplated here by parties who were large stockholders in the McColl Mfg. Co., operating a 7,500 spindle plant.

—South Carolina, Yorkville. A company is being organized here for the purpose of building a 10,000 spindle spinning and weaving mill. This is a separate enterprise from the one previously reported, in which John R. Ashe, of the Yorkville Cotton Mills, is treasurer, and which expects to double its capacity. Capital of the new mill will be $100,000, and W. N. Ashe has offered to subscribe $10,000, if the balance is made up. On this capitalization, the company could not start with such a large equipment, but the building will probably be arranged to accommodate that capacity later.

—Texas, Liberty. A new cotton mill is talked of for this place. R. L. McAllister has been elected president of the company, which was organized a few days ago. He desires information from cotton machinery builders as to prices, etc.

—*Texas, Waxahachie. A town meeting was held to consider the matter of a new cotton mill at this place, and it was decided to invite information from machinery builders and others as to the character and cost of equipment, building, etc. L. C. Todd has been elected secretary, and D. L. DuBose temporary president and manager. When the reports are received, definite proceedings will be taken in the matter.

—*Virginia, Lynchburg. A company is being formed at this place to build and operate in the near future a mill for the manufacture of cotton. William A. O'Brien, F. H. Winifree, F. L. Emery and others are among those interested, and they talk of a 25,000 spindle plant to begin with. This is probably the same project reported in April and later in August for which C. R. Makepeace & Co., were drawing plans.

Enlargements and Improvements.

—Georgia, Jewell's. The Jewell Mills, Bowen, Jewell & Co., proprietors, are

adding drawing frames, revolving flat top cards and other machinery.

—Maine, Auburn. An addition is to be made to the picker room of the Barker Mill. It will be a three story brick building, 50 ft. in length. Contract has already been awarded. A. M. Pulsifer, treasurer of the company, reports that they intend to put in new picking machinery. Total cost of the improvements will be about $13,000, about two-fifths of which will be spent on the new building and remainder will be expended for machinery.

—Massachusetts, Waltham. The Boston Mfg. Co. has completed an addition to its finishing house, which will be used for the purpose of dyeing and finishing the silks and satins made in the mill. The addition is of brick, 25 by 90 and three stories high. They have been sending this new line out to be finished but it has proved so successful that they will do all the work themselves.

—Massachusetts, Westfield. The steady growth of the business of the W. Warren Thread Works has necessitated increased facilties, and they have recently built an additional dye house with a daily capacity of 4,000 lbs., added a 150 h. p. Heine boiler, six automatic dressers and twelve Acme tubing machines. The office building has been moved to the front of the brick mill. They will use the lower floor for a stock room and the office itself has been moved to the second floor. About $28,000 has been spent on improvements thus far this year.

—New Hampshire, Nashua. The Nashua Mfg. Co. has begun work on a new cotton mill to be added to its plant here. The mill is to be used for weaving, and will be 100 by 300 ft., two stories in height, and will have a capacity of 600 looms.

—*New York, Cohoes. The John H. Murphy Mfg. Co., of Cohoes, has been incorporated with a capital stock of $150,000. The officers of the company are as follows: President, James Aitken; vice-president, Frank White; treasurer, William T. Ford; secretary, John H. Murphy. This new company has absorbed the John H. Murphy company at Cohoes, a co-partnership, and has purchased the Barker Building, in which the John H. Murphy Co. carried on its business. 5000 new spindles with auxiliary machinery will be put in for the manufacture of cop yarn. They expect this ready about January 1st. They already operate 90 machines on Jersey ribbed underwear.

—North Carolina, Charlotte. The Gold Crown Hosiery & Knitting Co., of this place, are about to add a yarn spinning plant to the mill, and will probably put in about 2,500 spindles at once. Part of the equipment has been ordered. It is also stated that new power machinery will be added.

—North Carolina, Goldsboro. The Wayne Cotton Mills are making considerable improvements and additions to their plant. Mr. Robbins, secretary and superintendent states that some new power machinery will be added soon.

—North Carolina, High Falls. The High Falls Mfg. Co. intend enlarging their plant by the addition of new machinery.

—North Carolina, Raleigh. The Willard Manufacturing Company of Willardville, N. C., manufacturers of rope and twine, intend moving to this place. Additional machinery will be bought and installed. The Willard Company also operate about 2500 spindles on cotton yarns, and it is probable that these will also be removed to Raleigh, and possibly added to by the purchase of additional spindle

—*Ontario, Kingston. The Dominion Cotton Mills Co., which was considering the removal of their plant from this town unless $25,000 bonus and other considerations were made, have decided not to ask for the bonus, but will apply for twenty years' exemption from taxation. In that case, they propose to make some additions and improvements to the building will install 300 new looms, and modernize the machinery in other respects, adapting it for making goods for export.

—Rhode Island, Woonsocket. A two story addition is being built to the finishing room of the Eagle Mill and will soon be ready for the installation of new machinery.

—* Rhode Island, Woonsocket. The finishing department of the Pycott Mfg. Co. will be located at the Hamlet Mill, where a new building will be erected for that purpose. It will be 50 by 100 feet, two stories high, and will cost, with machinery, about $50,000. It is expected that it will be ready for occupancy about the coming spring. The Pycott Mfg. Co. is the concern we mentioned in our issue of May 13th as having been organized for the purpose of manufacturing, dyeing, bleaching and finishing all kinds of textile fabrics, with or without the application of "Pyralin," which is a new process for waterproofing fabrics. The cloth, which is to be treated in the new finishing department, is made in the Hamlet Mill and it is probable that later on many improvements will be made in the mill to supply the various grades and styles of material to be treated in the finishing department. Col. Frank Harris is the manager of the company.

Mills Starting Up.

—*Connecticut, Glasgo. The Glasgo Yarn Mill, which has been running but four days a week lately, will soon start up on full time.

—Connecticut, Willimantic. The Willimantic Linen Co.'s Mills have started up.

—Massachusetts, Farnumsville. The Farnumsville Cotton Mills have resumed operations after a short sut down.

—*Massachusetts, West Warren. The town of West Warren has agreed to rebate the taxes of the Warren Cotton Mills. It has also agreed to make the assessed value $350,000. The mills will not start at once, as there is a great amount of repairing to be done and some new and improved machinery to be put in place.

—New York, New Hartford. Operations have been resumed in the mills of the New Hartford Cotton Mfg. Co., after a shut down of three weeks.

—*Pennsylvania, Chester. The Patterson Mills have been again sold, this time to the Chester Mfg. Co., for $108,000. This is the third time the mills have been sold within the last three months. It is believed that Dennis Howarth, president of the Chester Mfg. Co. who represents a syndicate of Philadelphia capitalists

will operate the mills in another line of goods.

—Rhode Island, Central Falls. The mills of the United States Cotton Co. which have been shut down since May 28th, have started up again.

—*Virginia, Petersburg. The Swift Creek Cotton Mills, which were sold at auction recently to August Wright and Charles Leonard, are to be transferred to a new company of Carolina mill men, viz., Alex. McRae, J. A. Pinchbeck, and J. N. Maloney, who are the chief owners of the Red Bluff Mills at Clio, S. C. The property will be improved, and possibly enlarged by its new owners, and it is expected it will start up some time during the present month.

Mills Shutting Down.

—Massachusetts, Millbury. The Farnumsville Cotton Mills have shut down for an indefinite period.

—Massachusetts, Smithville. Orders have been received at J. E. Smith's cotton mill to close the mill indefinitely as soon as the supply of stock on hand is run out.

Woolen.

New Mills.

—*Maine, Old Town. Contract has been given to M. C. Foster & Son for the erection of the new mill for the Ounegan Woolen Co.

—*Masachusetts, Pittsfield. The lower Pomeroy Mills have been leased by Helliwell & Co., of Leeds, England, for the manufacture of cotton warp, carriage and acsket cloth. The mills will employ about 150 hands when in full operation. The machinery is now under way and it is expected will be in active operation about the middle of this month. Mr. Helliwell is in Pittsfield and will remain there to superintend the placing of the plant.

—*North Carolina, Oxford. C. J. Cooper desires bids on machinery for the new woolen mill at this place. The product will be largely union woolen goods, and bids from builders of machinery of this character especially are invited.

—Pennsylvania, Brookville. Levi Heidrick and George W. Sykes, of Reynoldsville, are about to erect a large woolen mill at this place. The plant when completed will cost about $50,000.

—*Vermont, Bennington. Some time ago we stated that William Campbell of the Campbell Knitting Co., had purchased what is known as the Roberts Mill at Bennington Falls, for the purpose of converting it into a yarn mill to supply his establishment in the village. There has been some little delay in the transaction, as owing to certain foreclosure proceedings, it could not be deeded; but everything has now been settled, and Mr. Campbell will go ahead with his plans for a yarn mill.

—*Vermont, Bennington. The new yarn mill of Wm. Campbell, at Bennington Falls, will be erected on the site of the old Pulp Mill. It will be 60 by 100 feet, four stories high.

—*Minnesota, Fosston. The woolen mill being erected at this place is nearly finished and the machinery is all on the ground ready to be set up. Claude Neilson is a promoter of the project. This is the woolen mill we mentioned last March as having been organized here with $15,000 capital.

Enlargements and Improvements.

—Connecticut, Mystic. The Mystic Mfg. Co. are adding 20 new looms to their plant.

—Maine, Bridgton. The Pondicherry Mills Co. are making an addition to the dye house building at Mill No. 1.

—Massachusetts, North Billerica. A new dye house and a four story addition are being built to the Talbot Woolen Mills.

—*Massachusetts, Spencer. The contract for the additions to the mill of A. L. Taft has been let to Edward Price of Warren. The addition will be a one-story brick building, 44x37. The weave room will also be enlarged by an addition of a room 18x42 feet. A 75 h. p. engine will be installed, together with three shoddy pickers and a rag duster.

—Michigan, Eaton Rapids. It is said that Harner Bros. intend enlarging their woolen plant here.

—Missouri, St. Joseph. The Buell Mfg. Co. contemplate making some additions during the coming year, but not just at present, so we are informed.

—New Hampshire, Troy. A new mill is to be built by the Troy Blanket Mills Co., 274 by 58 feet. It will be located directly opposite their present mill.

—*New York, Amsterdam. Extensive improvements are being made to the plant of the Amsterdam Woolen Co., formerly the No. 3 mill of Warner de Forest & Co. It is not expected that the alterations to the plant will be completed so that work in the factory can be commenced much before Jan. 1.

—New York, Amsterdam. Mitchell Bros., shoddy manufacturers, are building an addition to their plant and will install new machinery.

—Pennsylvania, Bristol. It is reported that a large addition will be built to W. H. Grundy & Co.'s worsted mills.

—Pennsylvania, Philadelphia. The Anderson & Turnier Co., manufacturers of curtain and upholstery goods, is erecting a one-story factory at the corner of Mascher and Oxford Sts., a part of which is completed and in operation.

—Rhode Island, Westerly. The Westerly Woolen Company are building an addition to their drying room.

—Tennessee, Sweet Water. The Sweet Water Woolen Mills Co. has increased its capital stock from $60,000 to $100,000. The increase will be spent in making improvements in the plant and buildings. Plans and specifications are now being prepared and bids for new buildings and machinery will be asked for soon. The mills operate a five set plant, with 104 looms, product being doeskins and jeans. The proposed additions will about double their capacity.

—*Virginia, Lexington. The report that the Buena Vista Cassimere Mills will add machinery has been confirmed. The mills are owned by the Kent interests, of Clifton, Pa.

Mills Starting Up.

—Connecticut, Somersville. The Somersville Manufacturing Company's woolen mill has started up in full.

—Illinois, Chicago. The new Armour Felt works have started up.

—*Maine, Corinna. Machinery has begun to arrive for Chas. A. Greenwood's mill, which we reported Aug. 12th was in process of construction, and it will probably start up very soon.

—*Maine, Gardiner. The Perseverence Woolen Co., has started operations and the promoters report they have orders enough to keep them busy for a long tim and will probably have to run night ar day. They manufacture friezes and cassimeres. The plant consists of a dyehouse, three sets of cards and 15 looms.

—Maine, Guilford. It is reported that the Piscataquis Woolen Mills, which we announced Oct. 7th had shut down, are likely to start up again soon.

—Massachusetts, Athol. Extensive improvements and repairs have been made to the Eagle Woolen Mills and the plant has again resumed operations.

—*Massachusetts, Byfield. The Byfield Woolen Mills, which have been making repairs to their plant, have started up again.

—Massachusetts, Clinton. The Bigelow Carpet Co.'s mill, which has been almost closed for the past two weeks, started up recently.

—Massachusetts, Hancock. John Taylor has opened up the old woolen mill at this place.

—Massachusetts, Franklin. Ray's Mills started up again after two month's shutdown, and will run four days a week.

—Massachusetts, North Adams. Some of the departments of the Blackinton Mills have started up again after three months' shutdown. R. E. Schouler, who contemplated manufacturing fine woolen and worsted goods on his own account, has consented to remain with the mill for the present.

—Massachusetts, North Andover. The woolen mills here started up in some departments recently, after a shutdown of about four months. It is expected that the other departments will gradually be opened until the whole mill is running once more.

—Massachusetts, No. Bellingham. Ray's Woolen Mills have commenced operations again, but will only work five days a week for the present.

—Massachusetts, Pittsfield. The S. N. & C. Russell Mfg. Co. has started up again after an idleness of six weeks, during which time a new engine has been added and other improvements made.

—Massachusetts, Rutland. Moulton Bros. are putting machinery into the new satinet mill erected by M. R. Moulton during the present year and will soon start it up.

—Massachusetts, Webster. The Slater Woolen Co., which shut down for a short time to put in a new flume, has started up again.

—*Massachusetts, West Stoughton. Foss & Co.'s new shoddy mill is almost completed, and is ready for the installation of machinery.

—New York, Clayville. After a shut down of some two weeks, the Empire Woolen Co. has again resumed operations.

—Oregon, Dallas. It is reported that the Dallas Woolen Mill, James Shaw, former proprietor, has been leased, or practically sold to the Pioneer Woolen Mill Co. of Tacoma. It is said that operations will be commenced immediately and that new machinery will be added as soon as possible.

—Pennsylvania, Taylor. Looms are being placed in the new woolen mill at this place, Renard & Son are the present proprietors.

—*Rhode Island, Woonsocket. The River Spinning Mill, which we reported shut down a month ago, has resumed operations.

—*South Dakota, Sioux Falls. It is announced that Wm. Pettigrew has purchased the Sioux Falls Woolen Mills, of which he was formerly president. They are being started up.

Mills Shutting Down.

—Connecticut, Shewville. The Glen Woolen Mills have shut down for an indefinite period.

—*Maine, Guilford. The Piscataquis Woolen Co., has again shut down. This mill started up June 7th after a short shut down and has been obliged to close again on account of lack of orders.

—Massachusetts, Dalton. The Hampden Woolen Co. has shut down its plant for an indefinite period.

—Massachusetts, Dedham. The Merchants Woolen Mills are again shut down, after a short period of work, on account of lack of orders.

—Massachusetts, Pittsfield. The Taconic Woolen Mills, formerly owned by Wilson & Horton, but now in assignee's hands, have shut down for an indefinite period.

—Massachusetts, Uxbridge. Richard Sayles & Co.'s woolen mill has shut down for the present.

—New Hampshire, Franklin Falls. The Aiken Hosiery Mills shut down for a few weeks, while a new flume is bei built.

Knit.

New Mills.

—Georgia, Monticello. A company for the purpose of manufacturing hosiery and underwear has been organized here with H. V. B. Allen as president and C. D. Jordan, secretary and treasurer.

—*Massachusetts, New Bedford. The new Cornell Stocking Co. will be established in a building on Pope St. It is expected that the plant will be in full operation early in December. The capital stock of $29,000 is nearly all subscribed, and the incorporators are as follows: James P. Francis, president; Joseph C. Nowell, treasurer; directors, J. P. Francis, J. C. Nowell, Thomas H. Knowles, Herbert E. Cushman, and Arthur E. Perry.

—*Michigan, Quincy. Fuller details are to hand regarding the new company who intend manufacturing knit goods at this place. They will occupy an old building here which formerly was used for a creamery. A power house will be built and the other part of the building arranged for the knitting business. W. H. A. Godfrey will be superintendent and G. A. Cornell assistant superintendent.

—*Michigan, Quincy. W. H. A. Godfrey, superintendent of the Quincy Knitting Co., informs us that production will begin in the mill about Dec. 1, 1898, and that they will manufacture mittens, leggins, etc. This is the concern we mentioned last week. The capital of the company is $12,500; president, C. McKay; treasurer, C. H. Houghtaling; 15 knitting machines; dye-house.

—North Carolina, Merry Hill. The establishment of a knitting mill is contemplated here by J. H. White and associates. A plant of from 20 to 30 knitting machines is talked of.

—*North Carolina, Weldon. The following have been elected board of directors of the new knitting mill at this place: W. E. Daniel, W. R. Smith, W. T. Shaw, J. T. Gooch, W. A. Pierce, and E. Clarke. Capital stock will be $25,000, with the privilege of increasing to $50,000. The mill will employ about 125 hands. It is expected that work will commence in about a month.

—Pennsylvania, Duncannon. Negotiations are under way for the erection of a good-sized hosiery plant. It is expected to have the plant in operation in a few months.

—*Pennsylvania, Hummelstown. It is reported that work has been commenced on the foundation of a new knitting factory at the corner of Second and Landis Sts. Building is 26 by 60 ft., two stories high. It is expected that it will be put in operation about the first of the year. This is the factory we mentioned in July, in which W. H. Ulrick, Adam Knull and Joseph Rhoads are interested.

—*Pennsylvania, Wilkesbarre. The partnership between W. P. Morgan & Frank Zimmermann, is now an assured fact and they have started a knitting mill under the name of The Lee Park Knitting Mill, for the purpose of manufacturing men's half hose and misses ribbed hose. Capacity 200 dozen per day, 40 machines. A new dye house will be erected in a short time. Mr. Zimmerman is the superintendent.

—*South Carolina, Newbury. E. B. Wilbur, one of the promoters of the proposed knitting mill at this place, states that enough capital has already been raised or pledged, to build, and there is every prospect that the necessary amount of stock will be pledged in a month to guarantee the formation of the company. P. J. Vass is another of the promoters.

—South Dakota, Pierre. The Bedford Knitting Mills are being incorporated here with a capital of $15,000. The incorporators are: E. L. Squire, E. L. O. Apel and Fred Laury.

Enlargements and Improvements.

—Connecticut, Norfolk. The Norfolk & New Brunswick Hosiery Co. has closed down its entire plant at this place for an indefinite period, throwing about 150 hands out of employment.

—Georgia, Barnesville. The Oxford Knitting Mills want to buy at once two good second hand Union special twin needle finishing machines, a good second-hand button hole machine and three shirt knitting machines.

—*Georgia, Marietta. The capital stock of the Marietta Knitting Co. has been increased from $22,000 to $25,000, as we anticipated, and the increase will be devoted to the purpose of purchasing additional machinery. John H. Barnes is general manager of the company. The product is 175 needle half hose.

—Massachusetts, Northampton. The A. McCallum Hosiery Co., which are at present in the Belding Silk Mill, are considering the erection of a separate structure for their own use. The location has not yet been decided upon. The company manufactures silk and woolen hose.

—*New York, Cohoes. Ground has been broken for the new two-story brick addition to the Globe Mill of F. W. Kavanaugh & Co. The additions will be 55 by 70 feet, and will be of brick.

—New York, Utica. It is proposed to increase the capital stock of the Utica Knitting Co. from $100,000 to $200,000. The increase will be devoted to enlarging the plant. The company at present employs 300 hands.

—North Carolina, Kinston. The Orion Knitting Mills are considering the addition of new machinery to their plant next year.

—Ontario, Paris. The Penman Mfg. Co. are building an addition to their underwear factory which will give employment to 150 additional hands.

—Pennsylvania, Schuylkill Haven. An addition is being built to the underwear mill of A. Lautenbacher & Co.

—*Pennsylvania, Spring City. Foundations have been laid for the new dyeing establishment of W. C. Umer & Co. Sterns & Castor of Philadelphia are the architects.

—Pennsylvania, Wilkesbarre. The Wilkesbarre Hosiery Mills, Morgan & Menzie proprietors, are reported as being shut down for the purpose of putting in an additional boiler and other improvements.

—Tennessee, Sweet Water. The Mascot Knitting Mills intend putting in new machinery soon. At present they operate 50 knitting machines. J. A. Magill and J. A. Patton are owners.

Mills Starting Up.

—New York, Carthage. The Riverside Knitting Mill, Howard & Buck proprietors, expect to start work at once.

—New York, Hagaman. The Star Knitting Mills, owned by Mrs. H. H. Pawling, have resumed operations after a short shut down.

—New York, Little Falls. The Saxony Knitting Mills have started up again in order to finish up the work on several hundred dozens of knit underwear, which were in process of manufacture at the time of the failure of the firm last May.

—New York, Stittville. The Empire Knitting Mills, Hackett & Atwood, proprietors, will continue under the old firm name, Mrs. Mary E. Hackett having assumed the partnership of her late husband. The mill which has been shut down for five weeks, started up recently and it is said has enough orders on hand to keep it running in full till July 1899.

—*Vermont, Bennington. The mills of H. E. Bradford & Co., knit goods manufacturers, are expected to start up very soon. These mills have been thoroughly overhauled during the last few months.

—Pennsylvania, Hulmeville. Rumpf Bros. & Witty, of Philadelphia, have started up part of the plant in their new mill at this place.

Mil's Shutting Down.

—New Hampshire, Hillsboro Bridge. The Hillsboro Woolen Co. is shutting down for an indefinite period.

—New Hampshire, Laconia. The hosiery plant of the Hodgson & Holt Manufacturing Co. has stopped its carding, spinning and knitting machinery, and is finishing up goods on hand, preparatory to a shut-down for an indefinite period.

Silk.

New Mills.

—New Jersey, Belvidere. A new silk mill is being erected at this place by the Bamford Bros. Silk Mfg. Co. It will be a large and substantial structure, two stories high.

—*New Jersey, Newton. Contracts for the new branch mill of the Sterling Silk Co. have been awarded to local builders and the building is to be completed by Jan. 1, 1899.

—New Jersey, Paterson. Alexander McMunn, formerly of the silk firm of McMunn & Merhoff, have started a new concern in the Broomhead Mill, under the title of the Mascot Silk Co.

—*Pennsylvania, Phoenixville. The new silk mill being built at this place for Johnson, Cowdin & Co., formerly of Paterson, N. J., is well under way, and it is expected that the machinery will be placed and operations begun the first of next June.

—*Pennsylvania, Allentown. Additional information has been received regarding the new silk mill in So. Allentown, which will be called the Rioner Silk Co. The projectors are Allentown people, and the plant will consist of a two story brick main building 52x150 feet, engine house 22x35 feet, and boiler house 27x35. The company will put in its own dynamo for 450 incandescent lights. There will be a throwing plant in the basement, and the upper floors will be used for warping and weaving broad silk and ribbon. The plant will employ between 150 and 200 hands.

—Pennsylvania, Lock Haven. A large silk mill is to be erected at this place to be known as the Lock Haven Silk Mill, and will be managed by the firm at present in control of the Bloomsburg, (Pa.) Silk Mill. Citizens of Lock Haven have raised $30,000, and the company have added to that sum $20,000, the whole amount of which is to be used in the construction of the required building. The main building will be one story, 300 feet long by 100 feet wide, and engine and boiler room 50 by 60 feet. Machinery will be installed with a value of from $60,000 to $75,000, and the plant will give employment to about 450 hands when in full working order. F. G. Yorks is one of the members of the silk firm.

—*Pensylvania, Scranton Further particulars are at hand regarding the new silk factory to be located at Priceburg by the Valentine Bliss Mfg. Co. The buildings will be of brick, main building 100 by 150 feet, engine room 30 by 60 feet, and the boiler house 30 by 60. The cost of the plant, as at present contemplated, will be $25,000. The company is to be exempted from taxes for five years. This time will probably be extended later on. The factory when completed will employ 150 persons.

Miscellaneous.

New Mills.

—*New Jersey, Hohokus. The incorporators of Brookdale Bleachery which has purchased the buildings recently occupied by the Cohankus Mfg. Co., are as folows: Edward White of 829 President St., Brooklyn, N. Y.; Isaac T. Johnson, Thomas A. Deery and John L. Vansant of Hohokus, N. J. They will operate it as a bleachery, dyeing, finishing and finishing and printing cotton goods, with a capital of $110,000.

—Pennsylvania, Allentown. The contract for erecting the new dyeing plant of the Lotte & Mazeres Co., of Philadelphia, has been awarded to Ritter & Smith.

—Pennsylvania, Hamburg. It is expected that the new bleach works, Wilson, Knnmerer & Co., proprietors, will be in operation early next week. The capacity of the plant is about 2000 pounds daily.

Fires.

—Massachusetts, Fall River. Fire in the cotton waste mill of N. & N. R. Lewis, caused considerable damage on Oct. 6th.

—New York, Amsterdam. J. L. & G. S. Banta, shoddy and wool extracts, have made a general assignment to David C. Crouse, of Broadalbin. The plant is valued at $30,000. The cause of the failure is given out to be the death of J. L. Banta a few weeks ago, and slow collections.

—New York, Cohoes. A portion of an old factory in this town leased as a storehouse by W. & B. Lowenthal, wool, merino and cotton shoddy manufacturers, was recently destroyed by fire. The

building was full of stock and the loss to the Lowenthals will probably exceed $25,000; partially covered by insurance.

—North Carolina, Double Shoal. The Double Shoal Cotton Mills were damaged by fire recently to the extent of $10,000.

—North Carolina, Shelby. The Double Shoals Cotton Mill had a fire a few days ago, and the damage to the building and machinery amounts to $10,000. The company will purchase a large amount of new machinery to replace that damaged by fire. The carding was badly damaged.

—Pennsylvania, Philadelphia. The Franklinville Dye Works at Fifth and Luzerne Sts., was partially destroyed by fire recently. The two upper floors were entirely gutted and the first floor and contents badly damaged by water. The loss on building and contents totals up to $10,000, partly covered by insurance. Robert Myers is proprietor. It will be remembered that we reported two weeks ago that three stories were being added to these dye works at a cost ofo $10,000.

—Pennsylvania, Philadelphia. A small fire occurred in the carpet mill of Wm. Judge & Bros., Columbia Ave. and Leib St., causing damage to the amount of about $1500.

—Washington, Tacoma. The Tacoma Woolen Mills were destroyed by fire, October 1st, with a loss of $100,000.

Failures and Suspensions.

—Georgia, Athens. The Star Thread Co., has been placed in the hands of receivers, who will operate the mill until further orders from the court. If the receivership is made permanent, the property will be sold to the highest bidder. The assets of the company are about $100,000 and the liabilities $56,000. This step has been taken because the company was losing money and had not sufficient capital with which to operate profitably.

—Massachusetts, Boston. L. C. Bass, 122 Pearl St., dealer in bobbins, spools and shuttles, has assigned. Liabilities $155,344.

—Massachusetts, Plymouth. The Plymouth Woolen Co., manufacturing men's wear, have assigned to Isaac Williams. The company is composed of Henry Sawyer of Boston and Roswell S. Douglass of Plymouth. The assets and liabilities are not yet given out. The mill is busy with orders and has been working overtime and it is expected that the creditors wil agree to keep the plant in operation while settlement is being made. This failure is closely connected with that of the Sawyer Woolen Co.

—New Hampshire, Dover. As a result of the failure of the Sawyer Woolen Mills, the Somersworth Machine Co., in which the Sawyer family were largely interested, has made an assignment.

—New Hampshire, Dover. Sawyer Woolen Mills of the firm of F. A. & J. Sawyer made an assignment on Oct. 1st to Jeremiah Williams of the firm of Jeremiah Williams & Co., wool dealers of Boston, and A. W. Sulloway of Franklin, N. H. Liabilities are estimated to be about $1,000,000. The company had the best of credit and its assignment is a great surprise to the trade. It is rumored that outside speculations are mainly responsible for the failure. The Sawyer Mills are among the best known in the country and their line of men's wear was a standard one and they got prices generally in excess of their competitors on most grades. The mills will be kept running for the present in charge of W. D. Sawyer, who has been placed in charge by the assignees. The banks are understood to be the principal creditors.

—Vermont, Brattleboro. The machinery at the Whetstone Hosiery Co. will be sold under mortgage foreclosure Oct. 25th.

Facts and Gossip.

—*Canada, Montreal. Further particulars are to hand regarding the proposed English syndicate which is rumored will oppose the Dominion Cotton Co. Mr. James Jackson, the head of this movement, who was at one time manager for the Dominion Cotton Co., has returned from England and claims he has formed a company with $1,000,000 of English capital behind it. To offset this threatened competition, it is suggested that the Dominion Co. will close some of its smaller mills in Ontario and build a monster mill at a cost of $3,000,000 at Three Rivers, Que. One-half of this projected mill will be used for local trade and the other half for manufacturing for the Eastern and African markets.

—Connecticut, Bridgeport. Business is very brisk at the plant of the Salts Textile Co. The weaving department is operated until 9 o'clock evenings. If the rush of orders still continues, it is thought that other departments will have to be run overtime.

—Connecticut Willimantic. The Windham Cotton Mfg. Co., whose mills have been closed since March, to settle the estate of the late Matthew Watson, have had foreclosure proceedings brought against them by the Rhode Island Hospital Trust Co., of Providence. It is expected that this action of the trust company will result in a sale or change of ownership of the mill and that it will be put into operation once more.

—*Georgia, Alice. The Tate-Simmons Co. has been incorporated here for the purpose of conducting a mercantile business, operating in textile mills, etc. Capital stock is $50,000, with the privilege of increasing to $100,000. The company will continue to operate the cotton mill of P. M. Tate, known as the Harmony Mills, 2,000 spindles. Product will be coarse yarns and carpet warps. Incorporators are P. M. Tate, B. H. Simmons, F. C. Richards, J. F. Simmons and R. L. McClain. This is the company we mentioned last week as being incorporated for the purpose of building a woolen mill.

—Georgia, Macon. On the first of this month the Bibb Manufacturing Company took entire charge of all the business of the Macon Knitting Co., Macon, Ga., the Porterdale Mills, Covington, Ga.; The Taylor Manufacturing Co., Reynolds, Ga., and the Cordele Manufacturing Co., Cordele, Ga. All amounts due by these companies will be paid by the Bibb Manufacturing Co., and all amounts due them are to be paid to the Bibb Co. Orders for goods may be sent to the

several companies, as heretofore, but same will be invoiced to purchasers by the Bibb Mfg. Co.

—Maine, North Dexter. The Dews Woolen Co. is running over time every night.

—Maine, Oakland. The Cascade Woolen Mills are now running on reduced time but it is considered likely that the old schedule will be resumed in a few weeks.

—Massachusetts, Lowell. The Middlesex Fibre Co. has been incorporated with a capital stock of $100,000, $400 paid in, to manufacture and deal in vegetable and mineral fibres of all kinds. C. M. Gage, Tyngsboro, Mass., president; M. A. Hanigan, Fitchburg, Mass., treasurer.

—New York, Troy. Owing to large orders recently received, the Commercial Knitting Mills are now running overtime, employing a night and day force.

PERSONAL RECORD.

Cotton.

—J. M. Allred has resigned the superintendency of the Ada Mfg. Co.'s mill, Charlotte, N. C., to accept a similar position at the Shuford Mill, Hickory, N. C.

—William H. Alms has been elected president of the Argonaut Co., Covington, Ky., to succeed his brother, the late Fred H. Alms.

—Edward L. Anthony, at a recent meeting of the board of directors, was elected treasurer of the Laurel Lake Mills, Fall River.

—J. W. Arrington has resigned as secretary and treasurer of the Edna Mill, Reidsville, N. C., and George Howell has succeeded him.

—W. H. Birtwistle, boss spinner at Jewett City, Conn., has resigned.

—A. H. Bradley, formerly with the Rocky Mount, N. C., mill, is now in charge of the spinning room of the Abbeville, S. C. mill.

—Thomas Brewer has been engaged as second hand of mule spinning at the Whitinsville Cotton Mills, Whitinsville, Mass.

—J. L. Buffington has resigned his position at the Erwin Cotton Mills Co., Durham, N. C., to become manager of the carding and spinning at the Gaffney Cotton Mills, Gaffney, S. C.

—R. F. Cable has accepted the superintendency of the Odell Mfg. Co.'s mill at Concord, N. C.

—T. M. S. Coleman has succeeded P. W. Goodrum as overseer of spinning at the Anchor Mill, Huntersville, N. C. Mr. Coleman was formerly with the Langley Mfg. Co., Langley, S. C.

—T. Jefferson Coolidge, treasurer of the Amoskeag Mfg. Co., Manchester, N. H., has resigned his position and has been succeeded by C. W. Amory. Mr. Coolidge has been treasurer of this corporation for 22 years.

—W. F. Cornell, second hand in the cloth room of the Social Mfg. Co.'s mill, Woonsocket, R. I., has been promoted to overseer of cloth room.

—R. Cowell, of New Bedford, is now employed at the Warwick Mills, Centreville, R. I.

—James W. Cumnock, treasurer of the Manchester Mills, Manchester, N. H., has resigned his position. Mr. Cumnock's successor has not yet been appointed.

—E. Deaton is now occupied as loom fixer at the Highland Park Mfg. Co., Charlotte, N. C.

—W. W. Dudley, of Whitinsville, Mass., has gone to Philadelphia to enter the textile school to study cotton manufacturing.

—J. L. Eddleman, formerly overseer of carding and spinning at the Grendel Mills, Greenwood, S. C., is now with the Enoree, (S. C.) Cotton Mills.

—Carter Elliason, formerly carding overseer at the Ada Mfg. Co., Charlotte, N. C., has been appointed superintendent of the Alpha Mills, of that city.

—A. A. Freeman, boss carder at the Rocky Mount Mills, Rocky Mount, N. C., has been obliged to resign on account of his ill health.

—J. A. Glassey has been appointed overseer of the cloth room at the Exeter Mfg. Co.'s mill, Exeter, N. H.

—Henry Glover, superintendent at the Shove Mill, Fall River, Mass., resigned recently.

—T. C. Gore, formerly of the Cordele Mfg. Co.'s mill, Cordele, Ga., is now superintendent of Phoenix Mill No. 2, Nashville, Tenn.

—Frank Gorton, for the past three years boss spinner in the yarn mill of The New York Mills Co., New York Mills, N. Y., has resigned to accept a simlar position in Cohoes. Mr. Gorton was presented with a chair by the employees before he left.

—Daniel Grady, section boss at the Lancaster Mills, Clinton, Mass., has been promoted to the position of second hand of weaving.

—T. H. Halman, recently of the Mountain Island, N. C., mill, is the new superintendent of the Anchor Mills, Huntersville, N. C.

—Charles Hammock has been appointed superintendent of the Chewalla Cotton Mills, Eufaula, Ala.

—Thomas W. Harvey has been appointed superintendent of the Holt-Williamson Mill at Fayetteville, N. C.

—Frank Hawkins has resigned as overseer at the Warren, (R. I.) Mfg. Co.'s mills.

—William Hayes, for many years overseer of the mule room of Harmony Mill, No. 1, Cohoes, N. Y., has resigned.

—C. A. Home, overseer of weaving and dressing at the Exeter, (N. H.), Mfg. Co. has resigned.

—George W. Jackson has accepted a position as boss spinner, spooler and warper in Versailles, Conn.

—W. P. James, boss spinner of the W. R. Kindley Cotton Mills, Mt. Pleasant, N. C., was married recently to Miss Leffler of this city.

—Edward Kingsley has resigned as overseer of weaving in the Farnumsville Cotton Mills, Farnumsville, Mass., and removed to Syracuse, N. Y.

—Berry Laycock, formerly of the Lorraine Mfg. Co., Pawtucket, R. I., has secured the position of second hand in the Rockdale Mill of the Paul Whitin Mfg. Co., Northbridge, Mass.

—Elmer E. Lent, superintendent at the Greene & Daniels Mfg. Co.'s mill, Pawtucket, R. I., has resigned. Mr. Lent has secured an interest in the Harrison Yarn and Dyeing Co., Pawtucket.

—E. Loonan has charge of the weaving and finishing rooms for the Call Mfg. Co. Elmira, N. Y.

—Richard H. Matthewson is now boss spinner, spooler, warper and slasher with the White Rock Mfg. Co., White Rock, R. I.

—Jasper McBryan is the new carding superintendent at the Crown Cotton Mills, Dalton, Ga., having resigned his position with the Toccoa Cotton Mills, Toccoa, Ga.

—D. McGraw is reported to have succeeded A. F. Crombe as superintendent of the Augusta Factory, Augusta, Ga.

—Thomas McVeigh, of Forestdale, R. I., has accepted the position of second hand or ring spinning with Putnam Mfg. Co., Putnam, Conn.

—John Minnick, second hand of weaving at the Lancaster Mills, Clinton, Mass., has accepted the position of overseer of weaving at the Slater Mills, Jewett City, Conn.

—Fred Moser, formerly with the Richland Cotton Mills, Columbia, S. C., has accepted the superintendency of the Lockhart Mfg. Co.'s mill, Lockhart, S. C.

—Thomas Murphy, of Providence, R. I., is now loom fixer for James Callahan, Putnam, Conn.

—Wm. M. Murray, recently at the Wampanoag Mill, has succeeded Joseph Fisher as overseer of ring spinning at the mills of the Fall River Manufactory, Fall River, Mass.

—Edward L. Olson, designer for the Lyman Mills, Holyoke, Mass., has resigned to accept a similar position at the No. 2 mill of the Grosvenordale Co., North Grosvenordale, Conn.

—Col. James L. Orr, president of the Piedmont (S. C.) Cotton Mills Co., has returned to his home after an extended business trip to New England.

—L. W. Parker, president of the Victor Mfg. Co., Greer's Depot, S. C., is now at home after a visit to Massachusetts and Rhode Island.

—Moore Parker, of Raleigh, N. C., has entered the Lowell Textile School recently to take a course in textile mill engineering, with the view of following the cotton mill business in North Carolina.

—Alfred Platt, of Fall River, has succeeded Mr. Matthewson as second hand of carding in the Manville Co.'s mill, Manville, R. I.

—W. E. Poag is in charge of the carding and spinning at the Victoria Cotton Mills, Rock Hill, S. C.

—W. S. Porter, night superintendent of the Wilmington Cotton Mills, Wilmington, N. C., has resigned and accepted position of second-hand in the spinning department of the Phoenix Cotton Mills, Nashville, Tenn.

—Walter M. Scranton, of Oxford, Ala., has secured the position of overseer of spinning with the Fulton Bag & Cotton Mills, Atlanta, Ga.

—S. B. Shipp has been appointed superintendent of the Norris Cotton Mills, Catechee, S. C. He was formerly superintendent of the Chewalla Mill, Eufaula, Ala.

—Walter Shires, for seventeen years in the employ of The New York Mills Co., New York Mills, N. Y., and for the past four years overseer of the spinning department, resigned recently, and removed to Three Rivers, Mass., where he has accepted a position.

—James Sincoe, of Attleboro, is now second-hand of carding at the Fall River Manufactory, Fall River, Mass.

—Abbott E. Slade, treasurer of the Laurel Lake Mills, Fall River, Mass., has resigned.

—J. C. Tiddy, formerly of Shelby, N. C., is now in charge of carding and spinning in the Cabarrus Cotton Mill, Concord, N. C.

—C. G. Wabnitz, overseer in the weaving department of Geo. S. Colton's mill, Easthampton, Mass., has resigned.

—Morris Watkins, overseer of spinning in the Nos. 3 and 4 mills of The New York Mills, N. Y., has resigned. He had been in the employ of these mills for 30 years.

—George Wells, overseer of the weaving department of the Slater Mill, Slatersville, R. I., has resigned. A sum of money was contributed by those who have been in his employ, and was presented to him on his departure.

—J. N. Williamson, a well-known cotton mill man in North Carolina, will be married Nov. 9th to Miss Mary A. Saunders of Richmond, Va.

—Leonard Wilkinson has resigned as boss weaver for the Williamstown Mfg. Co., Williamstown, Mass.

—Theophilus W. Wilmarth, formerly superintendent of the Millbury Cotton Mills, has accepted position of superintendent of the Galveston Cotton Mills, Galveston, Tex.

Woolen.

—J. D. Bacon will resign his position at the Pearl Cotton Mills, Durham, N. C., to take charge of the spinning and carding at the Wiscassett Woolen Co., Albermarle, N. C.

—William Brady, formerly of Philadelphia, is now overseer of carding and spinning at the Holstein Woolen Mill, Salem, Va.

—Thomas Burns, formerly overseer of carding for A. M. Patton & Co., Manayunk, Pa., is now engaged in a similar capacity with the Dingley Mfg. Co., Philadelphia.

—B. H. Cochrane has resigned as boss dyer at he Ashaway Woolen Co., Ashaway, R. I., to accept a position with the Ray Woolen Mills, Franklin, Mass.

—Oland Comstock, formerly of Lowell, Mass., has secured the position of overseer of finishing with the Warren Woolen Co., Stafford Springs, Conn.

—John Connors has resigned as second hand of spinning at the Gilbert Mill, Ware, Mass., to accept a position as overseer at the Hoyle Woolen Mill, West Millbury.

—Patrick Cuff, formerly of Dayville, Conn., has accepted the position of overseer of dyeing at Hart, McArthur & Hart's Mill, Ashland, N. H.

—F. E. Devereux, of Burrillville, R. I., has been appointed boss dyer for the Warren Woolen Co., Stafford Springs, Conn.

—Thomas H. Donnelly has resigned as carding overseer at the Northern Ohio Blanket Mills, Cleveland, to accept a similar position in the mills at North Vassalboro, Me.

—Frank Duffy has resigned as boss dyer of the Kingston Hosiery Co., to accept a position in a similar capacity in the Chambly Woolen Mills, Quebec.

—J. Elliott, superintendent at the North Andover (Mass.), Mills, has resigned.

—H. B. Frazier, formerly finisher at the Summit Mill, Staffordville, Conn., is with Sayles & Jenks, Warren, Mass.

—Hugh Gallagher, formerly at Chester, Pa., has secured the position of overseer of spinning at the Dingley Mfg. Co.'s mill, Philadelphia, Pa.

—L. D. Green is superintendent of the Lapeer Woolen Mill, Lapeer, Mich.

—D. W. Hagar, of Jefferson, Mass., has accepted the position of superintendent at Hope Valley, R. I.

—L.B. Hollingsworth, of Providence, R. I., has been employed as carder at the Robinson Mills, South Windham, Maine.

—O. F. Ireland, superintendent of the Penobscott Woolen Co., Dexter, Me., was united in marriage recently to Miss Bertie Judd, formerly of Mt. Washington, Ky.

—E. R. Johnson is now dyer for the Otrabando Woolen Co., Norwichtown, Ct.

—N. W. Jones, recently boss carder at the Zanesville Woolen Mills, Zanesville, Ohio, is now employed in a similar capacity in the Tell City Woolen Mills, Tell City, Indiana.

—Walter H. Jones has secured the position of dyer with the Melrose Woolen Co., Auburn, N. Y.

—George H. Kearn, resident agent of the Blackinton Woolen Mills, Blackinton, Mass., has resigned his position, but will continue to have an interest in the mills in an unofficial way. M. Kearn has been connected with these mills for 16 years.

—John Kelleher, formerly with the Devonshire Mills, Goff's Falls, N. H., is now designer at the mill in Waco, Texas.

—Andrew Kilgour, formerly at Glenville, Conn., has recently accepted a position with the Lapham Woolen Co., Worcester, Mass.

—P. H. Lannan is the new wet finisher at the Kezar Falls Woolen Mill, Kezar Falls, Me.

—William H. Leyfrid has resigned his position of overseer in the finishing department of Allen Bros. Woolen Mill, Rochester, N. Y.

—Sidney H. Little will shortly remove to Warren, Mass., where he has accepted a position as designer with the Sayles & Jenks Co.

—L. H. Love has resigned as overseer of weaving at the George H. Gilbert Mfg. Co., Ware, Mass.

—David Mahoney, night boss spinner at the American Mills Co., Rockville, Conn., has resigned and returned to Blackington, where he was formerly employed.

—Russell Manter, formerly in the dyehouse of the Blackinton Woolen Mills, Blackinton, Mass., is now secondhand.

—D. N. McAllister, formerly at Fairmont, West Va., has secured a position as boss weaver at Flynn Bros.' Mill, Emlenton, Pa.

—James McCann, of Spencer, Mass., is now boss carder at the Lakeville Woolen Mill,, West Rutland, Mass.

—John T. Melbourn, employed as yarn boss at the Warren Woolen Co.'s plant, Stafford Springs, Conn., has resigned.

—R. J. Meyers has resigned as weaver of the Broad Brook Co.'s mill, Broad Brook, Conn.

—William Moorhouse, who has recently been working in the woolen mills at Sabattus, Me., has entered the Lowell Textile School, Lowell, Mass.

—William Morrison, a member of the Morrison Woolen Co., Dexter, Me., was recently married to Miss Emma Dorr.

—Welcome Mortimer, formerly boss weaver for the Merchant's Woolen Co., Dedham, is now employed in a similar capacity with Edwin Hoyle &Son, West Millbury, Mass.

—F. Platt, formerly of Defiance, Ohio, has taken charge of the dyeing and finishing in the Model Woolen Mill, Indianapolis, Ind.

—Charles H. Proctor has been appointed superintendent of the Dodge-Davis Woolen Mills, Bristol, N. H.

—William Ranshausen, Jr., has returned from Pittsfield to take charge of the finishing department of the Blackinton Co.'s mill, Blackinton, Mass.

—Lawrence Rattigan has been appointed overseer of the wool sorting at the Hinsdale (Mass.) Woolen Mills.

—John Richardson, for the last two years overseer of dyeing with James Roy & Co., West Troy, N. Y., has resigned.

—A. Rifenburg, for the past five years boss finisher at the Mineral Springs Mfg. Co., Stafford Springs, Conn., has accepted a similar position with the Summit Woolen Co., at Staffordville, Conn.

—Turner Rollinson, boss dyer at the Summit Woolen Co., Staffordville, Conn., has resigned.

—Charles A. Root, designer in the Calumet & Hecla Mills, Uxbridge, Mass., was recently married to Miss Jane Wheelock.

—Herbert A. Rowell has been appointed boss dyer of E. M. Rockwell's mill, Leominster, Mass.

—A. H. Ryan, of Wales, Mass., is reported to be the new superintendent of William G. Knowles' woolen mill, Newcastle, Del.

—George E. Saltonstall is now overseer of carding at Herbert M. Wilson's yarn mill, Bridgeton, R. I.

—R. E. Schouler, who recently resigned as superintendent of the Blackinton Woolen Mills, Blackinton, Mass., has been induced to reconsider his resignation, and will remain with the mills with which he has been connected so long.

—Timothy Sutcliffe has accepted position of designer for Rhodes Bros., Aston Mills, Pa.

—John Tower has resigned his position with the Hampden Woolen Co., Dalton, Mass.

—J. V. Turner, of Camden, N. J., has accepted the position of superintendent at the Brown Mfg. Co.'s mill, Dover, Me.

—William H. Wright has secured position of comber with the James Lees & Sons Co., Bridgeport, Pa.

Knit.

—Harry B. Brown, superintendent in the Ipswich Mills, Ipswich, Mass., while overseeing the removal of some machinery at the lower mill, was badly cut on the head.

—Charles Budlong, assistant overseer in the knitting department of the Anchor Knitting Mills, Whitesboro, N. Y., has been succeeded by Morris Roberts. Mr. Budlong has accepted a similar position in the Oneita Knitting Mill, at Utica.

—George Cox, of Mechanicsville, Conn., has secured the position of boss carder at the Velentine Knitting Co.'s mill, Bennington, Vt.

—L. F. Edwards, president of the Athens Knitting Mill Co., Athens, Ga., has resigned.

—J. J. Gilbert, of the Astoronga Knitting Mills, Little Falls, N. Y., and Miss Margaret E. Reed, of that city, were married recently, and are on a tour through the South.

—E. L. Holland, of Maine, has accepted the superintendency of the Stafford-Huguley Hosiery Co., Barnesville, Ga., E. H. Bloodworth, formerly superintendent, having resigned.

—Albert B. Mann, of Amsterdam, N. Y., has accepted the position of superintendent in the Henderson Knitting Mills, Hampton, Ga.

—Thomas Nesbitt has succeeded Timothy McAuliffe as mechanical superintendent at the Almonte, Ont., Knitting Co.

—Charles Smith, spinner for the Wright Health Underwear Co., Pownal, Vt., has resigned, and will accept a position at Hudson, N. Y.

—John P. Stack is now overseer of the rib department at the Victor Knitting Mills, Cohoes, N. Y.

—Dennis Sullivan, formerly second-hand in the carding department of No. 1 mill of A. V. Morris & Sons, Amsterdam, N. Y., has been promoted to the position of overseer of carding in the No. 3 mill.

—Charles Supprise, for a number of years overseer of carding at the Hudson River Knitting Mill, Hudson, N. Y., has taken charge of the carding department of the Troy Knitting Co., Troy, N. Y.

Miscellaneous

—Henry Ashton has resigned as second hand in the Tremont and Suffolk Mills, Lowell, Mass., and intends removing to Vermont to engage in business.

—Thomas M. Barry is now boss spinner, spooler and warper at the Samson Cordage Works, Shirley, Mass.

—John R. Butterworth has resigned as assistant superintendent at the American Print Works, Fall River, Mass., where he has been a number of years, and intends soon to remove to Providence to take control of the Providence Sizing Co., in which he has long been interested.

—James Carpenter has resigned his position as boss carder at the mill of the Hope Valley Woolen Co., Hope Valley, R. I., and will occupy a similar position in the Woodville Mill, manufacturing cordage, candle wicking and similar products.

—Fred P. Cole has been elected president of the American Worsted Co., Woonsocket, R. I., succeeding his father, the late Joseph E. Cole.

—Albert Crabtree, formerly dyer for E. M. Rockwell, Leominster, Mass., is now dyer at S. K. Wilson's worsted mill, Trenton, N. J.

—Charles S. Doggett, formerly connected with the Walpole Color Works, and later superintendent of the book cloth works of the Plimpton bindery, now has charge of one of the dye houses of the Montreal Cotton Co.

—A. Dumas, foreman for fifteen years at Belding Bros. & Co.'s Mill, Northampton, Mass., has severed his connection with that firm.

—J. A. Hill is now spinner at the Cohankus Mfg. Co., Paducah, Ky.

—Alexander F. Hobbs, superintendent of the Merrimac Print Works, Lowell, Mass., was recently married to Miss Louise Allen, daughter of Hon. Charles H. Allen, assistant secretary of the navy.

—Bernard Long, of Clayville, N. Y. has been appointed loom fixer for the Fulton Worsted Mill, Fulton, N. Y.

—David G. Rogers, formerly cloth inspector with the New Jersey Silk Co., has accepted position of traveling salesman for F. Eliot Low & Co., dealers in mill supplies, Paterson, N. J.

—Thomas Sheridan, has resigned his position with Yund, Kennedy & Yund, Amsterdam, N. Y., and now has a position in charge of the dyeing department of Charles W. Becker, of that city.

Deaths.

Charles H. Knowlton, died suddenly from heart disease on the street in Camden, New Jersey, shortly after seven o'clock Oct. 27, while on the way to business from his home, No. 620 Benson street, Camden, in his sixty-first year, having been born in Massachusetts, in November, 1837. He leaves a widow, one son, a physician, at present in Europe, and one daughter unmarried. Mr. Knowlton at the time of his death was president of the M. A. Furbush & Son Machine Company, having been elected to that office after the death of M. A. Furbush, Senior, in 1887. He first entered the employ of the concern in the fall of 1864 when the firm was Furbush & Gage, and immediately on his return from the Civil War, he having enlisted at the outbreak of the war in the Twenty-Fifth Regiment, Massachusetts Volunteers, and continued in the service until he was wounded by having his right hand shot off in an engagement at Arrowfield Church between Petersburg and Richmond, Virginia, May 9th, 1864. He continued in the service of the Furbush concern from the time he entered it until his death. He was also superintendent of the company's shops in Camden, in addition to being its president. He was always a Republican, a junior warden of Saint Johns Protestant Episcopal Church of Camden, president of the Homeopathic Hospital, Camden, director of the Central Trust Company, Camden, member of Post 5, G. A. R., Camden, a member of the Masonic Order and also connected with a number of other business and charitable institutions in the same city and Philadelphia.

—Solomon Bachman, of New York, died recently at Newburyport, Mass., of apoplexy. Mr. Bachman established the Merrimac Mills in Lowell, Mass., in 1865. He retired from active business three years ago.

—Justin L. Banta, senior member of the firm of J. L. & G. S. Banta, shoddy manufacturers of Amsterdam, N. Y., died recently at the age of 55 years.

—William Bogle, who for many years was president and superintendent of the Dutchess Co., Wappinger's Falls, N. Y., died recently at the age of 64 years. Mr. Bogle was a native of England, and has worked in Wappinger's Falls since 1857, when he arrived in this country.

—F. J. Brusch, for 18 years boss finisher at Milton Mills, N. H., died Oct. 3d, at the age of 79 years.

—Lewis Busiel, formerly proprietor of the White Mountain Mills, Laconia, N. H., died recently in Boston. Mr. Busiel is said to be one of the pioneer manufacturers of power loom textile goods in this country. He had devoted much of his spare time of late years to the invention and development of knitting machinery.

—John J. Dempsey, president and treasurer of the Dempsey Bleachery and Dye-Works, Pawtucket, R. I., died Oct. 6, aged 55 years.

—Richard Firth, of Tilton, N. H., died recently at the age of 75 years. M. Firth was at one time actively engaged in the manufacture of cloth in Tilton.

—Henry H. Haigh, of the firm of J. C. Haigh & Co., dyers and finishers, Frankford, Pa., died recently.

—William A. Harder, proprietor of the Aetna Hosiery Mills, Troy, N. Y., died recently.

—Hon. Aaron Hobart died in East Bridgewater, Mass., Oct. 9th, aged 80 years. Mr. Hobart was the son of Judge Hobart, and was born in Hanover, Mass., Nov. 19, 1817. At an early age, he went to New Orleans, where he was engaged in handling Southern products, especially cotton. He later became a member of the firm by which he was employed, the firm then taking the name of Tufts & Hobart. He returned to East Bridgewater about 1845, having amassed a considerable fortune in New Orleans. He opened an office on State St., Boston, and was more or less engaged in the cotton business during his life. He was at the time of his death president of the Lawrence Duck Mills.

—John L. Little, junior member of Walter Little & Co., Preakness Ave., Paterson, N. J., silk manufacturers, died recently.

—Charles A. Manson died at his home in East Rochester, recently, after a long illness. Mr. Manson was very many years the agent of the Cocheco Mfg. Co.

—Frederick Marcus, brother of Alfred A. Marcus, of Boston, died recently in Port Elizabeth, South Africa. Mr. Frederick Marcus was one of the largest wool merchants in South Africa.

—Ibrahim Morrison, junior member of the firm of A. S. Morrison & Bros., woolen manufacturers at Braintree, Mass., died recently after a long and severe illness, at the age of 53 years.

—William H. Parker, a prominent mill man of Massachusetts, died recently at the age of 81 years. Mr. Parker was president and director of the Parker Mills, a director in the Hargreaves Mills and New Bedford Spinning Co., as well as an owner in a number of other Fall River and New Bedford mills. He was also president of the First National Bank of Lowell.

—Eben B. Spaulding, a manufacturer of knit goods, died at Everett recently, aged 81 years.

—John Knox Stewart, a well-known knitting manufacturer, of Amsterdam, N. Y., died recently in that city. Mr. Stewart was elected member of the assembly in 1889, and was a well-known figure in political and business circles in Amsterdam.

Stephen A. Knight.

(Continued from page 26.)

ciation, and at the last annual meeting was elected its president.

He is an active and influential member of the Union Congregational Church, Providence, and was formerly connected with the Baptist Church at Phenix, R. I. He married, May 5, 1851, Ellen Parker, daughter of Zachariah and Eliza Parker of Pontiac, in the town of Warwick, R. I. There have been born to them three daughters, Florentine Augusta, Emma Jane, and Annie Brayton. Florentine and Annie died after attaining womanhood; their deaths occurring very close together, and were both buried on the same day. The surviving daughter, Emma Jane, is the wife of Franklin P. Jewett, a prominent physician of Providence.

The parents of the subject of our sketch were Stephen and Welthan (Brayton) Knight. Stephen A. was born in Cranston, R. I., June 5, 1828, and is, consequently, in his seventy-first year, though he would easily pass for at least fifteen years younger. This he ascribes to temperate habits, simple and plain manner of living from youth up. He attributes whatever measure of success he may have attained in life to constant and unremitting attention to business.

Graphite and Bronze Bearings.

The Graphite Lubricating Co., Bound Brook, N. J., have successfully put upon the market, graphite and bronze bushings, bearings and washers which have been tested for a number of years, for hoisting machinery and presses of various kinds, loose and friction clutch pulleys, wood working machinery, woolen and cotton mill machinery, paper mill machinery, engines, etc., etc. The intention of the company in putting their goods upon the market was to furnish a machinery bearing that would run without oil or grease, and testimony shows that they have been highly successful. Another purpose of the company, however, was to furnish a bearing having a dry lubricant, so that, with oil or grease, the friction and all causes for damage would be reduced to a minimum, due to any collecting of oil and stoppage of the oil duct, etc. This has been accomplished by the use of their compound of graphite. The efficiency of oil to lubricate a bearing in almost any kind of machinery is regarded by many of the best engineers as being largely increased by the use of pure graphite, but the trouble has existed, in their opinion, that no good way was known by which the graphite could be held permanently in position. To overcome this objection, the present mechanical method adopted by the Graphite Lubricating Company has been adopted. In perfecting the anti-friction bearing, it has been found necessary to use, in connection with the graphite compound, a special bronze having the best anti-friction properties that could be produced. After a large number of experiments were made, the difficult problem has been solved. The largest bearings made by this company, so far, have a 7⅝ inch bore, 20 inches long, and the smallest is three-eighths inch bore, one-half inch long. The life of this company's bushings has been found to be fully ten years, without oil or grease, on a loose pulley. They can be run without oil, but if oil is found necessary, it does not require more than a hundredth part of the usual quantity.

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Detailed information is given about each establishment, viz., the name of the company or firm, names of officers, agent, superintendent, what the mill makes, number sets of cards and combs (if woolen), number of spindles, number of looms, whether steam or water power, whether a dye house or not, who the selling agents are, or if the mill sells direct. In many instances it gives the name of the buyer of raw materials and supplies. To the traveling man, this directory is invaluable, as the maps give the location of the towns where there are mills, so that trips may be planned. The railroad connections are given, and distances may be estimated accurately from the maps.

IT ALSO HAS LISTS OF LARGE BUYERS OF TEXTILE FABRICS FROM FIRST HANDS INCLUDING MANUFACTURERS' SELLING AGENTS AND DRY GOODS COMMISSION MERCHANTS IN PRINCIPAL CITIES; THE MANUFACTURING CLOTHIERS, SUIT AND CLOAK MAKERS, JOBBERS, LARGE RETAILERS BUYING FROM FIRST HANDS. ALSO LISTS OF DEALERS IN RAW MATERIALS IN PRINCIPAL CITIES, INCLUDIND RAG DEALERS. BUYERS' INDEX OF TEXTILE MACHINERY AND SUPPLIES.

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Those who want the all-cloth cover book at $3.00 (including the Textile World), should speak early as the supply is limited.

TEXTILE BOOKS.

The following are recent publications, which we will furnish upon receipt of their price.

Plain Series of Cotton Spinning Calculations, by William H. Cook, 91 pages.

This book gives original calculations relating to cotton spinning, giving the position of the different pulleys and wheels, which are taken into consideration when making calculations; and also points where the necessary changes are made when altering from one count to another. Price $1.

The Printing of Textile Fabrics, by C. F Seymour Rothwell. 8vo., 312 pages.

This is a practical manual on the printing of cotton, wool, silk, and half-silk fabrics, with plates, illustrations in the text, and specimens of printed fabrics. The work contains but little information of a purely chemical or theoretical character, as it has been covered by the "Manual of Dyeing," by Knecht, and others. The author has confined himself more to the practical side of the subject, and the processes and machinery described by him are principally those with which he has had practical experience. Price $6.50.

Ornamental Design for Woven Fabrics, by Stephenson & Suddards. 273 pages, 66 illustrations.

This is a text book dealing with ornamental design for woven fabrics, for the use of the student, and has been written for the purpose of suggesting helpful ideas to designers and manufacturers of textiles, and aims at bringing artistic textile work into practical touch and closer relationship with the technical requirements of manufacturing. It takes up such subjects as Geometric Design; How to Plan an All-over Repeating Design; The Drop Pattern; The Sateen Arrangements; Borders, Corners, Stripes; The Structure of Ornamental Flowers, Foliage, etc. Price $2.50.

The Power Loom, by Alexander Brown.

This is a practical, well written treatise of 118 pages, on the construction of the power loom and the art of weaving, giving descriptions of the texture produced by different numbers of harnesses. The text is illustrated with diagrams, and contains calculations and instructions for the production of cotton, woolen, linen and jute fabrics. It was written with the intention of serving as a text book for those engaged in the trade. Notwithstanding it relates to English machinery, it is of value to those operating that of American make. Price $1.25.

Jacquard Weaving and Designing, by T. F. Bell. 300 pages. Fully illustrated.

The contents of this work have been derived from a long course of art and technical training, together with a lengthy practical experience in textile manufacturing and designing, by the author. The descriptions are as concise as is compatible with fairly clear explanation. Price $3.00.

Cotton Weaving and Designing, by John R. Taylor, 288 pages, fully illustrated.

This work is by a well known writer and lecturer on this subject, and treats of such topics as: Hand and Power Looms; Drop and Circular Box Looms; Dobbies; Jacquard and Leno Weaving; Terry Looms; Principles of Designing, Plain and Figured; and Textile Calculations. This work is of much value. Price $2.50.

Woolen Spinning, by Charles Vickerman.

This is a most excellent work for students in textile schools, and for skillful, practical men in woolen mills. It takes up the principles that underlie the various processes and operations of the earlier parts of manufacture. It has chapters devoted to Wool; Wool Sorting; Scouring; Bleaching; Mixing, etc., Carding and Spinning. 352 pages. Price $1.75.

The Student's Cotton Spinning, by Joseph Nasmith.

This is a standard book on spinning. It treats of mixing, opening, scutching, carding, card clothing, combing, roving, spinning, reeling, waste spinning, etc. 593 pages. Price $2.50.

The Mechanism of Weaving, by T. W. Fox.

A treatise of 464 pages, presenting exact and practical information upon the principles of weaving. Takes up such topics as Harnesses; Shedding; Dobbies; Jacquards; Card Cutting; Picking; Pickers; Swivel Weaving; Beating Up; The Reed; Taking-up Motion; Temples; Trimming and Fixing of Parts. 256 illustrations. Price $2.50.

Manual of Dyeing, by Knecht, Rawson and Loewenthal. In three volumes.

Decidedly the best work of the kind for a proper understanding of the present state of the art of dyeing, for the use of practical dyers, manufacturers and students. It takes up such subjects as, Water; Acids; Alkalies; Mordants; Natural and Artificial Coloring Matter; Machinery used for dyeing, etc. Has numerous illustrations and specimens of dyed fabrics. Price $15.00.

Draw Frames and Fly Frames. By Thomas Thornley, 380 pages.

This is the only work especially devoted to the drawing and roving processes, and is intended to benefit those who are directly concerned in the practical operation of the machines under discussion, with particular stress on the points which will give the best results from machines in their actual manipulation. Among the subjects treated may be mentioned the following: Drawing Frames; Fly Frames—Winding, Building Motion, Differential Motions; Roller Setting and Drawing; Defective Roving Bobbins; How to Put up Frames; etc. Price $2.00.

Cotton. By Christopher P. Brooks, 384 pages, 174 illustrations.

This is the most acceptable book on this subject that has been published. The subject has been presented in a remarkably attractive style, and is treated in a manner not to be found elsewhere. Cotton is considered in its botanical features, its cultivation, preparation for the market, and as an article of commerce. A full chapter is given on the commercial uses of the seed for oil, etc. It is a volume that will be of interest to the cotton factor, merchant, broker, and all whose business it is to buy or sell the fibre in its raw or manufactured condition. We cannot speak in too flattering praise regarding the merits of this book. Price $3.00.

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Patents.

(Continued from page 22.)

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Plush Fabric, Double. 611,104. E. Claviez, Chemnitz, Germany.

Spinning Rings, Apparatus for Finishing. 612,381. E. A. Darling, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass. and Portland, Me.

Spinning Frame. 611,338. W. E. Sharples Fall River, Mass.

Spinning Mule, Self Acting. 611,816. W. Monk, Newark, N. J.

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BUYERS' INDEX.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Alphabetical Index to Advertisements follows this Classified List.

Architects and Mill Engineers.
Berlin Iron Bridge Co, The, East Berlin, Ct.
Ferguson, John W, Paterson, N. J.

Automatic Feeds for Cotton and Wool.
Harwood, Geo. S, & Son, 53 State St, Boston.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Balling Machine.
Torrance Mfg. Co, 18 Davis St, E. Newark, N. J.

Bandings.
See under Yarns.

Belting.
Alexander Bros., 410 No. 3d St., Phila., Pa.
Billington, J. H. & Co., 113 Chestnut St., Philadelphia.
Boston Belting Co., 256 Devonshire St., Boston, Mass.
Fell, Geo. & Son, Bolton, England.
Link Belt Machinery Co., Chicago, Ill.
See also Mill Supplies.

Belt Dressing.
Alexander Bros, 410 No. 3d St, Phila, Pa.

Belt Hooks.
Field, Frank E., New Haven, Conn.

Bindings.
See Tapes and Braids.

Bleaching Materials.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Bobbins, Spools, Shuttles, Etc.
Nashua Spool and Bobbin Co., Nashua, N.H.

Boxes, Cloth Boards, Etc.
Pearson, J. T, Kensington, Pa.

Braids.
See Tapes, Braids and Edgings.

Burr Pickers.
Curtis & Marble Machine Co., Worcester, Mass.
Sargent's, C. G., Sons, Graniteville, Mass.

Card Clothing.
Ashworth, Elijah, Fall Biver, Mass.
Leigh, Evan A, 35 Mason Building, Boston.

Calico Printers' Machinery and Supplies.
Butterworth, H. W., Sons & Co., Philadelphia.
New Bedford Copper Co, New Bedford, Mass.
Phillips Co, The Thomas, Providence, R. I.
See also Dyeing, Bleaching Machinery, etc.

Carders' Tools.
Brown, W. H, Mechanic St, Worcester, Mass.

Carpet Machinery.
Altemus, W. W, & Son, 2816 N. 4th St, Phila, Pa.
Crompton & Knowles Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester, Ms.
Furbush, M. A, & Son, Machine Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St., Phila., Pa.

Chemicals and Apparatus.
Bullock & Crenshaw, 528 Arch St, Phila, Pa.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Chemist.
Adriance, John S., 105 East 39th St., New York.

Cloth Testing Machine.
McKnight, S, 771 Broadway, New York.

Combs (Wool and Cotton).
Crabb, William, & Co, Newark, N. J.
Townsend, Thomas, 157 Orange St., Providence, R. I.

Comber Needles.
Townsend, Thos., Providence, R. I.

Copper Print Rollers.
New Bedford Copper Co, New Bedford, Mass.
Phillips Co, The Thomas, Providence, R. I.
Revere Copper Co, 174 Oliver St, Boston.

Copper Work for Dyers.
Phillips Co, The Thomas, Providence, R. I.

Cotton (Egyptian).
Stoddard, Haserick, Richards & Co., Boston.

Cotton Machinery.
Altemus, W. W, & Son, 2816 N. 4th St, Phila-Pa.
Ashworth, Elijah, Fall River, Mass.
Cobb, Thad. S., Machinery Co , Lowell,
Crompton & Knowles Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Draper Company, Hopedale, Mass.
Fairmount Machine Co, 22d and Wood Sts, Philadelphia.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kilburn, Lincoln & Co, Fall River, Mass.
Leigh, Evan A, 35 Mason Building, Boston.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Phillips Co, The Thomas, Providence, R. I.
Stoddard, Haserick, Richards & Co, Boston, Mass.
Townsend, Thomas, 157 Orange St., Providence, R. I.
Whitin Machine Wks, Whitinsville, Mass.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Cotton Openers and Lappers.
Howard & Bullough American Machine Co, Pawtucket, R. I.

Cutters for Knit Fabrics.
Kennedy, Thos. (Cutters, etc.,) Cohoes, N. Y

Designers.
Fresnel, Gustave, 125 W. 56th St, N. Y.

Dextrine.
Stein, Hirsh & Co, 165 Duane St., New York.

Dryers.
Philadelphia Textile Machinery Co, Philadelphia, Pa.
Phillips Co, The Thomas, Providence, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Dusters.
See Wool and Waste Dusters.

Dyeing, Bleaching and Finishing.
Brophy's, T, Sons, Jasper St, Philadelphia.
Greenwood, R. & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket and Valley Falls, R. I.
Littlewood, G. J., & Sons, Manayunk, Pa.

Warren, W, Thread Works, Westfield, Mass.
Webster Dye Works, Webster, Mass.

Dyeing, Drying, Bleaching and Finishing Machinery.

Butterworth, H. W, & Sons Co, Phila, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Co, 22 and Wood Sts, Philadelphia.
Granger Foundry & Machine Co, Providence, R. I.
Hopkins, A, & Co, Bridgeton, R. I.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Lincoln, The, Co, 54 Arch St, Hartford, Ct.
Phenix iron Foundry, Providence, R. I.
Phillips, The Thomas Co, 91-95 South Main St, Providence, R. I.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass. (Drying.)
Woonsocket Machine & Press Co, Woonsocket, R. I.
Woonsocket Napping Machine Co, Woonsocket, R. I.

Dye Sticks.

Haedrich, E. M, 311 1-2 Walnut St, Phila, Pa.

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Anchor Color Mfg. Co, 464 Cherry St, New York.
Bischoff, & Co, 87 Park Place, N. Y.
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Cochrane Chemical Co., 50 Kilby St., Boston.
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Jaeck Bros., The, Co., 62-68 No. 11th St, Brooklyn, N. Y.
Janney, O. S, & Co, Phila. and Boston.
Johnson, Chas. A, & Co, 22 Dey St, N. Y.
Johnson, Wm. G, & Co, Uncasville, Conn.
Keller, John J, & Co, 104-106 Murray St, N. Y.
Klipstein, A, & Co, 122 Pearl St, N. Y.
Koechl, Victor, & Co, 122 Hudson St, N. Y.
Matheson, W. J, & Co, 182-184 Front St, N. Y.
Merrimac Chemical Co, Boston, Mass.
N. Y. & Boston Dyewood Co, 55 Beekman St, New York.
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Sykes & Street, 85 Water St, N. Y.
Thomas, N. Spencer, Elmira, New York.
Webster Dye Works, Webster, Mass.

Dyers and Finishers.

Boston Finishing Works, Williamstown Mass.
Cranston Worsted Mills (yarns), Bristol R. I.
Firth & Foster Co, Kensington, Pa.
Greenwood, R, & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket, R. I.
Oakdale Dye Works, 913 W. York St, Phila, Pa.
Pawtucket Dyeing & Bleaching Co, Pawtucket, R. I.
Warren, W, Thread Works, Westfield, Mass.
Webster Dye Works, Webster, Mass.

Dyers' Clogs.

Wildman, Jos, & Co, 1908 N. Front St, Phila.

Edgings.

See Tapes, Braids and Edgings.

Electrotyping and Printing.

Whitcomb, H. C, & Co, Boston.

Elevators.

Cohoes Foundry & Machine Co, Cohoes, N.Y.
Eastern Machinery Co, The, New Haven, Conn.
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Berlin Iron Bridge Co, E. Berlin, Ct.
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Express Money Orders and Travelers' Cheques.

American Express Co. offices in every city

Fans—Exhaust and Ventilating.

See Ventilating Apparatus.

Feeders

See Card Feeds.

Feed Water Pumps.

Goulds Mfg. Co, Seneca Falls, N. Y.
Phœnix Iron Foundry, Providence, R. I.

Filters for Water.

New York Filter Mfg. Co., 26 Cortlandt St., New York.

Finishing Machinery.

See Dyeing, Drying, Bleaching and Finishing.

Fire Extinguishers.

H. R. Bennett, 1217 Filbert St., Phila.

Fluted Rolls.

Cohoes Foundry & Machine Co, Cohoes, N.Y
Thurston, A. G, & Son, Box 528, Fall River. Mass.

Fulling Mills for Woolen Goods.

Hopkins, A, & Co. Bridgeton, R. I.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter Jas, Machine Co, No. Adams, Mass.

Gas Engines.

Jones, Lewis, 60½ and Media Sts, Phila, Pa.

Gas Singeing Machines.

Butterworth, H. W. Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Ms.

Gear Cutting Machine.

Blaisdell, P, & Co, Worcester, Mass.
Whiton, The D. E, Co, New London, Conn.

Harness Varnish.

D. L. Witmer & Bro, 5th St. and Germantown Ave, Philadelphia.

Heating.

See Ventilating.

Heddles.

Watson, L. S, Mfg. Co, Leicester, Mass.

Hosiery Boards.

Pearson, J. T, Kensington, Pa.

Hose and Rubber Goods.

Boston Belting Co., 256 Devonshire St., Boston.

Ink, Stamping.

Witmer, D. L, & Bro, 5th St. and Germantown Ave, Philadelphia.

Insurance (Employers' Liability).

Employers' Liability Assurance Co, 28 Central St, Boston, Mass.

Knit Goods Edgings, Trimmings, etc.

Cheney Bros, Silk Goods, 479 Broome St, N. Y.
Friedberger & Co, Edgings, Germantown Phila, Pa.
Hepner & Horwitz, Lacings, 30 Howard St, N. Y.
Krout & Fite Mfg. Co, 2632 Mascher St, Phila.
Weimar Bros, 1817 East York St, Phila. Pa.

Knit Goods Finishing Machines, Crochet, Etc.

Excelsior Sewing Machine Co, 120 N. 7th St, Phila, Pa.
Merrow Machine Co, The, Hartford, Conn.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 2079 E. Cumberland St, Phila, Pa.

Knit Goods Brushers.

Ardrey, S. B, & Sons, Bristol, Pa
Jones, Lewis, Philadelphia, Pa.

Knitting Machine Cylinders.

Paxton & O'Neill, 129 Bread St, Phila, Pa.
Stafford & Holt, Little Falls, N. Y.

Knitting Machinery.

Boss Knitting Machine Works, Elm and Reed Sts., Reading, Pa.

Branson Machine Co., 506 John St., Philadelphia.
Brinton, H, & Co, 213 Race St, Phila, Pa.
Campbell & Clute, Cohoes, N. Y.
Cooper, Chas, Bennington, Vt.
Crane Mfg. Co, Lakeport, N. H.
Excelsior Knitting Machine Manufacturing Co., Allentown, Pa.
Hepworth & Co, Lehigh Ave. and Mascher St, Phila, Pa.
Jenckes, E. Mfg. Co, Pawtucket, R. I.
Jones, Lewis, 60 1-2 and Media Sts, Philadelphia, Pa.
Kennedy, Thos. (Cutters, etc.), Cohoes, N. Y.
Keystone Knitting Machine Mfg. Co, 40 No. 7th St, Philadelphia, Pa.
Lamb Mfg. Co., Chicopee Falls, Mass.
Leighton Machine Co, Manchester, N. H.
Little Hustler Napper Co., Hudson, N. Y.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
McMichael & Wildman Mfg. Co, Norristown, Pa.
Mueller, A, 760 Lexington Ave, Brooklyn, N. Y.
Nye & Tredick, 606 Arch St, Phila, Pa.
Paxton & O'Neill, 127 Bread St, Phila, Pa.
Pepper Mfg. Co, Lakeport, N. H.
Scott & Williams, 2079 E. Cumberland St., Phila., Pa.
Stafford & Holt, Little Falls, N. Y.
Standard Machine Co., 508 Minor St., Philadelphia, Pa.

Knitting Needles and Supplies.

Breedon, Wm, & Son, Amsterdam, N. Y.
Cooper, Chas, Bennington, Vt.
Corey, Wm, Co, Manchester, N. H.
Crane Mfg. Co , Lakeport, N. H.
Dodge Needle Co., Manchester, N. H.
Ives, Loyal T, New Brunswick, N. J.
Keystone Knitting Machine Mfg. Co, 40 No. 7th St, Philadelphia, Pa.
Lydall, H, & Foulds, Manchester, Conn.
Manufacturers' Supplies Co., 66 No. 4th St., Philadelphia.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
Page Needle Co, Chicopee Falls, Mass.
Treat, Orion, Manchester Green, Conn.
Wardwell Needle Co, Lakeport, N. H.

Laboratory Outfits.

Bullock & Crenshaw, 528 Arch St Phila, Pa.

Lamps, Electric.

Edison, Thomas A., Jr., 27 William St., New York.

Looms.

Crompton & Knowles Loom Works, Worcester, Mass.
Draper Company, Hopedale, Mass.
Fairmount Machine Works, 22d and Wood Sts. Philadelphia.
Furbush, M. A, & Son Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St, Phila Pa. (For wire.)
Kilburn, Lincoln & Co, Fall River, Mass.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Whitin Machine Works, Whitinsville, Ms,
Woonsocket Machine & Press Co, Woonsocket, R. I.

Loom Picker Manufacturers.

Crompton & Knowles Loom Works, Worcester, Mass.
Loom Picker Co, Biddeford, Me.

Lubricators.

Dixon, Jos., Crucible Co, Jersey City, N. J.
Graphite Lubricating Co, Bound Brook, N. J.

Lumber.

Stearns, A. T, Lumber Co, Neponset, Mass.

Lumpers.

Gerry, George, & Son, Athol, Mass.

Machinery Dealers.

Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.

Machinists' Tools.

Blaisdell, P, & Co, Worcester, Mass.
Whiton, The D. E. Co, New London, Conn.

Mails.

Walder, J, Paterson, N. J.

Measuring and Folding Machines.

Curtis & Marble Machine Co, Worcester, Ms.
Elliott & Hall, 54½ Hermon St, Worcester Mass.

Mills For Sale.

Denny, R. B., 143 Federal St., Boston.

Mill Builders and Engineers.

Berlin Iron Bridge Co, The, East Berlin, Ct
Ferguson, John W, Paterson, N. J.

Mill Supplies.

American Supply Co, Providence, R. I.
Bamford & Smith, Pascoag, R. I.
Bristol, The, Co., Waterbury, Conn
Buckley's, Benj. Son, Gun Mill, Paterson, N. J.
Douglas Manufacturing Co., Fall River, Mass.
Harwood, Geo. S, & Son, 53 State St, Boston.
Hill, Jas, Mfg. Co, Providence, R. I.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Spofford, Wm. S, & Son, 5-11 Culver St, Providence, R. I.
Thurston, A. G, & Son, Fall River, Mass.
Watson, L. S, Mfg.Co, Leicester, Mass.

Napping Machines.

American Napping Machine Co, Williamstown, Mass
Ardrey, S. B, & Sons, Bristol, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Jones, Lewis, 60 1-2 and Media Sts., Philadelphia, Pa.
Little Hustler Napping Co, Hudson, N. Y.
Woonsocket Napping Machine Co, Woonsocket, R. I.

Novelties.

Stohn, C, 178 Green St, Jamaica Plain Mass.

Pantagraphs for Mill Engraving.

Johnson, C. A, & Co, 22 Dey St, New York.

Patent Solicitors.

Crosby & Gregory, 34 School St, Boston, Mass.
Crossley & Goddard, 23 Court St, Boston.
Massink, H., Amsterdam, Holland.
Phillips & Anderson, 53 State St, Boston.
Wright, Brown & Quinby, 53 State St, Boston, Mass.

Penstocks.

Dalrymple, George, Fair Haven, Vt.

Perforated Copper

Beckley, A. J. & Co., Garwood, N. J.

Peroxide of Sodium.

Roessler & Hasslacher Chemical Co., 100 William St, New York.

Picker Sticks.

Loom Picker Co., Biddeford, Me.

Picking, Carbonizing and Garnetting.

Garfield Woolen Co, Garfield, N. J.
Kennebec Woolen Mills 2025 Naudain St., Philadelphia.

Pipe Covering (Magnesia).

Keasby, R. A. 54 Warren St, New York.
Keasby & Mattison Co, Ambler, Pa.
Nightingale, S. C, & Childs, Atlantic Ave Boston, Mass.

Pneumatic Conveying.

See Ventilating.

Power Transmitting Machinery.

Ameledema Oilless Bearing Co, 149 West Berkley St, Wayne Junction, Pa.
Channon, H, Co, 25 Market St, Chicago, Ill.
Eastern Machinery Co, New Haven, Conn.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunt, C. W. Company, Staten Island, N. Y.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jones, W. A, 53-59 South Jefferson Street, Chicago, Ill.
Kilburn, Lincoln & Co, Fall River, Mass.
Link Belt Machinery Co, Chicago, Ill.

Presses.

Crawford, J. J, & Son, Nashua, N. H. (Power Screw, Hydraulic, Hollow Steam Plate.)
Curtis & Marble Machine Co, Worcester, Ms.
Hart, Charles, Frankford, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunt, C. W. Co, Staten Island, N. Y.
Phillips Co, The Thomas, Providence, R. I
Pownall, F. H, Iron Works, Jamesburg, N. J.
Sullivan Machinery Co., Claremont, N. H.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Pressing Irons, Gas and Air Heated.

Sheftall, C. H, Mgr, 305-307 Mercer St, New York.

Printers and Embossers.

Novelty Textile Printing Co, 447-449 W. 14th St, New York.

Pumps.

Goulds Mfg. Co, Seneca Falls, N. Y.

Reed and Harness Manufacturers.

American Supply Co, Providence, R. I.
Loom Picker Co, Biddeford, Me.
Walder, J, Paterson, N. J.

Ribbons.

Cheney Bros, S. Manchester, Ct.

Roller Skins.

Fell, Geo, & Son, Bolton, England.

Roofing, Gravel, Slag and Composition.

Armitage Mfg. Co, Richmond, Va.
Johns, H. W., Mfg. Co., 100 William St. New York.
Warren Chemical & Mfg. Co, 45 Fulton St, New York.

Roofing, Paint and Paper.

Armitage Mfg. Co, Richmond, Va.

Roving Cans and Sheet Metal Work for Mills.

Hill, Jas, Mfg. Co, Providence, R. I.
Laminar, Fibre Co., No. Cambridge, Mass.
N. E. Ventilating & Heating Co, 930 Manton Ave. Providence, R. I.
Sullivan Machinery Co, Claremont, N. H.

Sample Cards.

Merchants Sample Card Co., 79 Crosby St., New York.
Yerrington, F. M, 17 Batterymarch Street, Boston.

Schools.

American Correspondence School of Textiles, Lowell, Mass.
Lowell Textile School, Lowell, Mass.
Philadelphia Textile School, Phila, Pa.

Sewing Machines and Supplies.

Curtis & Marble Machine Co, Worcester, Mass.
Frame, Gibbons, 2nd and Diamond Sts, Phila, Pa.
Manufacturers' Supplies Co , 66 No. 4th St , Philadelphia.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 6th and Arch Sts, Phila, Pa.

Shearing Machinery.

See Dyeing, Drying, Bleaching and Finishing.

Shell Rolls.

Cohoes Foundry & Mach. Co. Cohoes, N. Y.
Thurston, A. G, & Son, Box 528, Fall River, Mass.

Shoddies.

See Wool Shoddies

Shuttles.

See Bobbins, Spools, Shuttles, Etc.

Silk Machinery.

Butterworth, H. W. Sons Co, Philadelphia.
Crompton & Knowles Loom Works, Worcester, Mass

Singe Plates.

Butterworth, H. W. Sons Co., Philadelphia.
New Bedford Copper Co, New Bedford, Ms.

Sizing, Starch and Gums.

Columbia Mfg. Co, 143-151 Pocasset St, Fall River, Mass.
Stein, Hirsch & Co, 165 Duane St, New York.

Slashers.

Cohoes Foundry & Machine Co, Cohoes, N. Y.
Lowell Machine Shop, Lowell, Mass.
Phillips Co, The Thomas, Providence, R. I.

Soaps.

Holbrook Manufacturing Co., New York.
India Alkali Works, Boston, Mass.

Spindles.

Buckley, Benj's, Sons, Gun Mill, Paterson, N. J.
Draper Company, Hopedale, Mass.
Ward & Vandegrift, Elmer, N. J.
Whitin Machine Wks, Whitinsville, Mass.

Spindle Tubes.

Bamford & Smith, Pascoag, R. I.

Spinning Cylinders.

Hill, Jas, Mfg. Co, Providence, R. I.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Spinning Frames.

See Cotton Machinery.

Spinning Frames for Wool

Woonsocket Machine and Press Co., Woonsocket, R. I.

Spinning Rings.

Draper Company, Hopedale, Mass.
Whitinsville Spinning Ring Co, Whitinsville, Mass.
Worcester Spinning Ring Co, Worcester, Mass.

Spinning Tubes.

Buckley, Benj's. Son, Gun Mill, Paterson, N. J.

Steam Boilers.

Brown, C. H, & Co, Fitchburg, Mass.

Steam Boiler Insurance.

Hartford Steam Boiler Inspection & Insurance Co, Hartford, Conn.
Mutual Boiler Insurance Co, 31 Milk St, Boston.

Steam Engines.

Brown, C. H, & Co, Fitchburg, Mass.
Hooven (The), Owens & Reutschler Co, Hamilton, O.

Steam Specialties.

Butterworth, H. W. Sons Co., Philadelphia.

Steam Traps.

Haines, W. S. C 136 South 4th St, Phila, Pa.

Tanks, Tubs and Vats.

Caldwell Co., W. E. 202 Brook St., Louisville, Ky.
Challenge Wind Mill & Feed Mill Co, 195 High St, Boston, Mass.
Corcoran, A. J, 11 John St, New York.
Cypress Lumber Co, Apalachicola, Fla.
Stearns, A. T, Lumber Co, Neponset, Mass.
Woolford, George, 2240 No. 9th St, Phila, Pa

Tapes, Braids and Edgings.

Friedberger & Co, Germantown, Pa.
Goff, D. & Sons, Powtucket, R. I.
Krout & Fite Mfg. Co., Allegheny Ave. and Emeral 1 St., Philadelphia.
Weimar Bros, 1817 East York St, Phila, Pa.
Young, Wm. M, 3638-40 Frankford Ave, Philadelphia, Pa.

Tentering Machines.

See Dyeing, Bleaching Machinery, Etc.

Tension Pulleys.

N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Testing Machines.

Howard, Geo. C., 1783 Barker St., Phila., Pa

Towers.

Caldwell Co., W. E. 202 Brook St., Louisville, Ky.
Challenge Wind Mill & Feed Mill Co, Boston, Mass.

Traveler's Cheques.

American Express Company.

Turbines.

(See Water Wheels.)

Ventilating Apparatus.

Allington & Curtis Mfg. Co., Saginaw, Mich., and East Cambridge, Mass
Berry, A. Hun, 23 W. 1st St, Boston, Mass.
Massachusetts Fan Company, Room 641, 53 State St, Boston.
New England Ventilating & Heating Co, Providence, R. I.
Philadelphia Textile Machinery Co, Hancock St, above Lehigh Ave, Phila, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Washers (Cloth).

Hopkins, A, & Co, Bridgeton, R. I.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Phillips Co, The Thomas, Providence, R. I.

Watches and Clocks.

Elgin National Watch Co., Elgin, Ill.

Watchman's Clock.

Eco Magneto Clock Co, 620 Atlantic Ave, Boston.
Nanz & Co, 116A Chambers St, New York.

Water Wheels.

Bradway, C. P, West Stafford, Conn.
Christiana Machine Co, Christiana, Pa.
Humphrey Machine Co., Keene, N. H.
Hunt, Rodney, Machine Co, Orange, Mass.
Leffel, James, & Co, Springfield, O.

Water Wheel Governors.

Bradway, C. P, West Stafford, Ct.
Cohoes Foundry & Machine Co, Cohoes N. Y.
Leffel, James & Co, Springfield, Ohio.
Lombard Water Wheel Governor Co, 61 Hampshire St, Boston.

Winders. (Hosiery.)

Universal Winding Co, 226 Devonshire St, Boston.

Wood Pulleys.

Saginaw Manufacturing Co, Saginaw, Mich.

Wool.

Lyon, John H, & Co, 12 Reade St, N. Y.
Pratt, Daniel S., 180 Summer St, Boston.

Wool Cleaning Compound.

India Alkali Works, Boston.

Wool Combing Machinery.

Crabb, Wm, & Co, Newark, N. J.
Crompton & Knowles Loom Works, Worcester, Mass.
Townsend, Thomas, 157 Orange St, Providence, R. I.

Wool Extracts.

Garfield Woolen Co, Garfield, N. J.

Wool and Waste Dusters.

Gerry, Geo, & Son, Athol, Mass.
Sargents', C. G., Sons, Graniteville, Mass.
Stillman-Randall Machine Co, Westerly, R. I.

Woolen and Worsted Machinery.

Altemus, W. W, & Co, 2816 N. 4th St, Phila Pa.
Butterworth, H. W. Sons Co., Philadelphia.
Cobb, Thad. S., Machinery Co., Lowell, Mass.
Crompton & Knowles Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester, Mass
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Furbush, M. A. & Son Machine Co, Phila, Pa.
Harwood, Geo. S, & Son, 53 State St, Boston.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Philadelphia.
Phillips Co, The Thomas, Providence, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Stoddard, Haserick, Richards & Co, Boston, Mass.
Woonsocket Machine & Press Co Woonsocket, R. I.
Woonsocket Napping Machine Co., Woonsocket, R. I.

Wool, Hair and Noils.

Becker, Chas. W, Agt, Amsterdam, N. Y.
Fowles & Co, 106 Church St, Phila.

Wool Shoddies.

Barnett, William, 164 Broadway, Albany N. Y.
Becker, Chas. W, Agt, Amsterdam, N. Y.
Garfield Woolen Co, Garfield, N. J.
Kennebec Woolen Mills, 2025 Naudain St, Philadelphia.
Riverdale Woolen Co, Riverdale, Northbridge, Mass.

Wool Sorters and Scourers.

Kennebec Woolen Mills, 2025 Naudain St, Philadelphia.

Wool Washing, Preparing and Drying Machinery.

Phillips Co, The Thomas, Providence, R. I.
Sargent's, C. G, Sons, Graniteville, Mass.

Yarns, Threads, Etc.

Banding.

Moore, C. & Co. 12 S. 5th St, Phila, Pa.
Warren, W, Thread Works, Westfield, Mass.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Tucker & Cook Mfg. Co, Conway, Mass.
Whittier Cotton Mills, Lowell, Mass.

Cotton Yarns.

American Spinners' Cotton Yarn Exchange, 45 Milk St, Boston.
Burnet & Co., 24 George Sq., Glasgow, Scotland.
Catlin & Co, New York and Boston.
Clark, Wm. Co, Westerly, R. I.
Cohannet Mills, Taunton, Mass.
Dana Warp Mill, Westbrook, Me.
Eddy & Street, Providence, R. I.
Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Fleming & Chapin, Philadelphia.
Germantown Spinning Co, Germantown, Pa.
Grant Yarn Co, Fitchburg, Mass.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Hadley Co, Holyoke, Mass.
Hawes, O. S, & Bro, Fall River, Mass.
Indian Orchard Co., Indian Orchard, Mass.
Jenckes, E., Mfg. Co., Pawtucket, R. I.
King, Alex, & Co, 54 Leonard St, New York City.
Mitchell, Jas. F, & Co, Boston and Phila, Pa.
Montgomery, J. R, Co, Windsor Locks, Ct.
Monument Mills, Housatonic, Mass.
Orswell Mills, Fitchburg, Mass.
Sanford Spinning Co, Fall River, Mass.
Tucker & Cook Mfg. Co, Conway, Mass.
Whittier Cotton Mills, Lowell, Mass.

Gassed Yarns.

Greene & Daniels Mfg. Co, Pawtucket, R. I.
King, Alex, & Co, 54 Leonard St, New York.

Glazed Yarns.

Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Indian Orchard Co., Indian Orchard, Mass.
King, Alex, & Co, 54 Leonard St, New York.
Malcolm Mills Co, Frankford, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Harness Twines.

Fawcett, Hughes, 115 Franklin St., N. Y.
Hadley Co, 95 Milk St, Boston, Mass.
King, Alex, & Co, 54 Leonard St, New York.
Moore, C, & Co., (S. W. cor. 5th and Market Sts.)
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Hosiery and Knitting Yarns.

American Spinners' Cotton Yarn Exchange, 45 Milk St. Boston, Mass.
Boyer, B. F, & Co, Camden, N. J.
Campbell, Geo, & Co, Phila, Pa.
Clark, Wm. Co, Westerly, R. I.
Clasgens, The J. & H. Co, New Richmond, Ohio.
Cohannet Mills, Taunton, Mass.
Colchester Mills, 86-88 Franklin St, New York.
Eichmann & Sternberg, 530 Broadway, cor. Spring St , N. Y.
Germantown Spinning Co, Germantown, Pa.
Greene & Daniels Mfg. Co. Pawtucket, R. I.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Jenckes, E., Manufacturing Co, Pawtucket, R. I.
King, Alex, & Co, 54 Leonard St, New York.
Mitchell, James E, & Co, Phila. and Boston
Monument Mills, Housatonic, Mass.
New England Thread Co, Pawtucket, R. I.
Orswell Mills, Fitchburg, Mass.
Rockwell, E. M, Leominster, Mass
Sanford Spinning Co, Fall River, Mass.
Shimer, Geo, & Son, 5th and Erie Sts, Camden, N. J.
Skerry, A T, & Co, 47 Leonard St, N. Y.
Walcott & Campbell Spinning Co, New York Mills, Oneida Co, N. Y.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Flax, Hemp, Jute and Ramie.

Burnet & Co., 24 George Sq., Glasgow, Scotland.
Eichman & Sternberg, 530 Broadway, cor Spring St., N. Y.
Fawcett, Hughes, 115 Franklin St., N. Y
Holland & Webb, N. Y.

Mohair Yarns.

Eichmann & Sternberg, 530 Broadway, cor Spring St., N. Y.
Goff, D. & Sons, Pawtucket, R. I.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

Novelty Yarns, Tinsels, Silk Noils, Etc.

Burnet & Co., 24 George Sq. Glasgow, Scotland.
Cranston Worsted Mills, Bristol, R. I
Eichmann & Sternberg, New York City.
Indian Orchard Co., Indian Orchard, Mass.
Malcolm Mills Co, 229 Chestnut St, Phila. Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

Silk Yarns.

Cheney Bros, S. Manchester and Hartford Ct.
Eddy & Street, Providence, R. I.
Eichmann & Sternberg, 530 Broadway, cor. Spring St , N. Y.
Hawes, O. S, & Bro, Fall River, Mass.
Ryle, Wm, & Co, 54 Howard St, N. Y.

Woolen and Merino Yarns.

Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Clasgens, The J. & H. Co, New Richmond, Ohio.
Eddy & Street, Providence, R. I.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Jenckes, E. Mfg. Co., Pawtucket, R. I.
King, Alexander & Co, 54 Leonard St, N. Y.
Rockwell, Edward M, Leominster, Mass.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.

Worsted Yarns.

Alleghany Worsted Mills, Phila, Pa.
Botany Worsted Mills, Passaic, N. J.
Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Campbell, Geo, & Co, Phila, Pa.
Cranston Worsted Mills, Bristol, R. I.
Croft, Howland, & Sons, cor. Broadway and Jefferson Ave., Camden, N. J.
Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Elsasser, Albert R, Addingham, Pa.
Goff, D. & Sons, Pawtucket, R. I.
Herbst & Jones, 21st and Naudain Sts, Philadelphia, Pa.
King, Alexander & Co, 54 Leonard St, N. Y.
Phoenix Mills Co, 13 Letitia St, Phila, Pa.
Shimer, Geo, & Son, 5th and Erie Sts, Camden, N. J.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Waverly Worsted Co, Main St. and Green Lane, Manayunk, Pa.

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MILLS FOR SALE! Woolen Mills and other manufacturing plants Agent for Sale of Mill Properties.

R. B. DENNY, 143 Federal St., BOSTON, MASS.

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The advertisers in the following columns should be addressed in care of TEXTILE WORLD, or inquiries concerning them may be addressed directly to "Information Department, TEXTILE WORLD," as full particulars of each advertiser are on file, and the addresses of suitable agents, superintendents and foremen for every branch of the textile industry will be furnished to manufacturers.

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WOOLEN SUPERINTENDENTS.

1443 **Agent or Supt. of Woolen Mill.** Age 42; married. Has been manager, supt. or assistant supt for the last twenty years. Experienced in all classes of goods and makes of machinery. Has good references. A first-class manufacturer.

1452 **Superintendent or Designer** for woolen mill. Age 42; married, American. Has had a large experience, and is well recommended. Out of employment at present on account of his mill shutting down, and can take a position at once on moderate salary. Has worked on all classes of woolen goods, cotton warps, and has had 13 years' experience on fancy woolen dress goods. Familiar with the Knowles looms and Davis & Furber cards and mules.

1398 **Woolen Superintendent or Designer** of recognized ability and at present employed as a superintendent of 36 set woolen and worsted mill. He finds it necessary to remove from New Jersey on account of his wife's health. His past record is first-class and this is an unusual opportunity to secure the services of a first-class superintendent.

1250 **Superintendent,** or would accept a position as designer in a good woolen mill. Understands fancy cassimeres, cloakings, dress goods, kerseys, unions and worsteds. Can produce the Jacquard effect on an ordinary cotton, Knowles loom. Refers to good mills.

1203 **Superintendent, Woolen,** or superintendent and designer. Age 39; married. Has held a position as superintendent 9 years; 2 years in one mill and 7 in another. Has good references. A good man on meltons, coverts, cassimeres, worsted and kerseys; also serges.

935 **Woolen Supt. and Designer.** Graduate of German Textile school. Has managed successfully two mills in the West. Thoroughly up on designing and general mill management. Age 35. Married. References first-class.

1387 **Woolen Superintendent,** one who has had a thorough practical experience in setting up and operating woolen mills. Would take charge of small mill or finishing department in large mill. Now employed but wishes to change. Correspondence solicited.

1268 **Woolen** superintendent or designer. First-class experience in England and America. A first-class man in every way; age 34; married. Fancy worsteds, cheviots, novelty goods, cassimeres, overcoatings, cloakings, dress goods, piece dyes, worsteds and cheviots.

COTTON SUPERINTENDENTS.

1326 **Assistant Superintendent.** American. Has taken a full course in the Philadelphia Textile School, and holds diploma from same. Has also had practical experience in the various departments of a cotton mill, two years in the designing room, part of the time as assistant designer. Has worked on damask, Marseilles and crochet quilts, and other cotton goods, and has a practical knowledge of all the prominent makes of machines. Refers to former employers and others. Not at present employed. Can take position immediately.

1332 **Supt. with long experience** in both Northern and Southern mills. Has started 3 Southern mills, on print cloths, broad and narrow sheetings and fine shirtings. First class references from all past positions. Age 48. Might accept position as overseer of large weave room.

1265 **Superintendent** wants position as superintendent of cotton cloth mill. Has had charge of each department in the mill; aged 28 years; married.

1306 Young American wants position as cotton superintendent. Experience mostly on cotton warps. Has been bookkeeper, overseer of carding and spinning; also superintendent in Massachusetts mills.

1184 **Cotton Mill Superintendent,** wants position. Age 50; married. Sheetings, shirtings, drills, etc.; also all kinds of yarns and yarn dyeing. Has good references. Superintendent eighteen years at one mill.

578 **Cotton Superintendent** with experience as boss carder, master mechanic and superintendent on prints, sheetings, twills and sateens. An American of high character, and whose ability is proved by past record. Age 35, married; can accept position at once.

1390 **Cotton Superintendent.** Especially qualified for a mill making dress goods and fine shirtings. Experience with first-class mills as designer and manager. A young man of high character. At present employed.

1269 **Cotton** superintendent, carder, spinner and dresser; 43; married. Has held position in some of the best mills; is strictly temperate, and well recommended. Cotton, flannels, ginghams, crochet and Marseilles quilts, etc.

1236 **Supt. of Cotton Mill** desires to change position. Is thoroughly competent, steady and reliable. Good mechanic, manager, push and executive ability. Over 15 years experience, and fully understands how to keep production right as to quantity, quality and lowest cost. Best system of economy maintained. First-class references can be given.

WOOLEN CARDERS.

1439 **Second Hand in Card Room.** Has worked as second hand and boss carder in knitting and woolen mills. Age 38; unmarried. Can take situation at once. Accustomed to all classes of work. Familiar with Davis & Furber machines. Refers to former employers.

1321 **Boss Carder.** Over 30 years' experience in woolen mills. American. Will except second hand position in large mill. Well up on dress goods, broadcloths, flannels, kerseys, etc. Has best references.

1314 **Woolen Carder.** American. Age 30. Married. At present employed. Experience on beavers, cassimeres, cheviots, dress goods. Well spoken of by former employers. A first class man for a small mill.

1197 **Woolen Carder** wants position. Overseer over 16 years in some of the best woolen mills. Accustomed to all kinds of work. Age 50; married. Well recommended.

1180 Wants position as 2nd hand of carding in woolen or knit mill. Age 23; single. Has been successful in like position. Prefers position in Mass., R. I., Conn., N. H., Penn., N. Y. or N. J. References if required.

1233 **Felt** Overseer of Carding. A good man on felt or woolen goods. Aged 35; married. Can refer to past employers.

1249 **Carder and Spinner,** woolen, wants position. Familiar with a great variety of goods. 37 and married.

1248 **Carder,** woolen. Age 37 years; married. 10 years with one of the best mills in New England. Dress goods, beavers, blankets, cotton warp hair lines and kerseys.

1378 **Overseer Woolen Carding.** American, age 32, married. With one mill 13 years, and another 4 years. Excellent references from each. A first-class carder in every way.

COTTON CARDERS.

1430 **Cotton Carder** just out of work because of mill closing indefinitely. Has had long experience in Conn. and Mass. mills, and refers to past employers. Can undoubtedly give satisfaction on any kind of goods.

1432 **Overseer Cotton Carding.** This man has worked up from sweeping boy to overseer in the same mill and we have a letter from the former manager expressing the highest regard for his ability and character. Age 30. Married.

423 **Cotton Carder or Supt.** At present in the South but desires to return to the North. Early training and most of his experience was in N. E. mills. Understands combing. Age 38. Married.

1368 **Overseer on Second-Hand Cotton** Carding wants a position in small room at $2.50 per day or upwards. Will do his own grinding. Or, would take a first-class second hand job. Last five years in one place. Thoroughly practical and understands all the machinery in the card room. Age 37; married. Good reference. Prefers New England.

1238 **Second** hand of cotton carding. 37; married. Open for engagement.

WOOLEN SPINNERS.

1299 Woolen Spinner who has had experience as second-hand would like a position as boss spinner. Would accept small salary to start. Has worked on cloakings, dress goods and Scotch tweeds in New England mill.

1195 **Spinner, Woolen.** American; age 31; married. Experienced on yarns from 1 to 7 1-2 run. Refers to past and present employers. Wants position as overseer. Will not go to Southern States, Canada or Connecticut. Is an experienced overseer.

1374 **Overseer Woolen Spinning.** All makes of mules, has had charge in good mills. Experience covers yarns for hosiery, fancy woolens and worsteds. Age 28; married.

633 **Woolen Spinner,** now overseer in good mill, wants to change on account of wife's health to N. E. or Western states. 9 years experience as boss in good mills. Would start for $2.50 a day. Age 37. First-class references.

1276 **Spinner,** woolen. Wool and shoddy from 1-2 to 10 run, cassimeres, flannels, dress goods, underwear and blankets. Davis & Furber, Furbush & Sons, Johnson & Basset, and Schmidt machinery. Good references.

COTTON SPINNERS.

1424 **Overseer, Spinning.** Mules preferred. At present employed in N. B. mill. Has held position as overseer 6 years. Single. Will go anywhere.

1407 **Cotton Frame Spinner** now in charge of nearly 30,000 spindles in a Southern mill wants to return north. First-class reference both north and south where he has worked. Age 30. Married. American.

1438 **Cotton Mule Spinner** who has worked on plain white goods only desires to secure a permanent position in the Eastern or Central states. Has good references and is perfectly reliable. Age 45. Married.

1429 **Cotton Ring Spinner** who has been overseer 5 years and second hand 8 years. Worked on white and colored yarns, spooled and twisted. Refers to past employers in Maine and Mass. Age 36. Married.

1350 **First-Class Ring Spinning** overseer, also spooling, warping, slashing, web drawing; large experience, highest references as to skill, character and executive ability. At present employed in Fall River. Age 48, American.

1187 **Overseer of Dressing** or spinning wants a position in a cotton mill. Is an A1 man on colored or white goods, and understands slashing and beaming thoroughly. American; age 38; married. Has had charge in some of the best mills of New England. Sheetings, shirtings, dress goods, cheviots, flannels and sateens. Familiar with Mason, Whitin and Lowell machinery.

1344 **Mule or Frame Spinner,** is at present employed in first-class print cloth mill in New England, where he has been for 9 years. Can take charge of room. Age 28, married; good references from present place. Wants $3.00 or more.

WOOLEN WEAVERS.

1433 **Overseer Woolen Weaving.** More than 18 years' experience in large mills in Canada and the States. He is highly recommended for position of boss weaver or assistant superintendent. Experience covers a large variety of cloths on Crompton & Knowles looms. Age 36. Married.

1434 **Boss Weaver, Woolens.** Wants a job in a large mill and can handle same in good shape. Age 36. Married. Has made fancy worsteds, fancy cassimeres, meltons, dress goods, etc.

1340 **Worsted Weaver** would like position in a small mill at moderate salary; experience as fixer and in cloth room. Age 38, married. Knowles and Crompton looms; references good.

1008 **Wants boss job in flannel mill.** Northern New England preferred, also a good man for dresser or fixer, has worked on flannels, serges, cheviots, fancy dress goods. Is 34, married.

1385 **Worsted or Woolen Weaver** of fancy worsted and woolen mens' wear and novelty dress goods. Has held positions in leading N. E. and Phila. mills. Expert on Crompton & Knowles looms: Best references. Age 38; married. Can start at once.

1313 **Woolen Weaver.** First class references, and experience on fancy cassimeres, kerseys, beavers, dress goods, etc. At present not employed, for good reasons. Age 44. Married.

1130 **Overseer of Woolen Weaving** wants position. Would accept 2nd hand's position in a good mill. American; protestant; age 36; single. Good man on Knowles fancy and plain looms, also Davis & Furber. Cassimeres, worsteds, meltons and flannels. Will not go South, West or Pennsylvania.

COTTON WEAVERS.

1242 **Overseer Cotton Weaving.** Familiar with plain cloths, sateens, fancy checks and stripes, box looms and dobbies. References. Age 43; married. One weaver, one twister in family.

1425 **Overseer, Cotton Weaving** Age 38. Married. At present employed in large Mass. mill where he has been for 7 years as overseer. Worked on all kinds of goods and is well experienced. American. Refers to past and present employers.

1380 **Overseer Cotton Weaving.** Held overseer's position for 5 years in Mass. mill, but now out because of change in management. A man of well-known ability. Age 48; married, American. One of the best weavers in New England. Will go South to a good position.

1373 **Overseer Cotton Weaving.** A man with especially good opportunities to gain wide experience in large Mass. mills; now second hand, having worked up from band boy. American, age 29, married; best of references.

1334 **Jacquard and Dobby Weaver** and designer on Knowles machines. 8 years' experience in this position. At present employed and can furnish excellent references. Age 38; married.

1333 **Overseer of Cotton Weaving** with more than 20 years' experience in weave rooms of N. E. and Canadian mills. Experience on all kinds of white and colored, plain and fancy work, except Jacquard, American and English, looms. Married; age 37.

DYERS.

180 **Woolen Dyer.** Age 42; married. Has had a large experience, and is a good practical man. Used to all classes of goods. Has worked largely on government orders. Good indigo dyer. Refers to former employers and others.

1442 **Boss Dyer.** Age 30 years; married. Has worked on all kinds of goods except cotton. Has excellent references. Refers to former employers and others.

1440 **Dyer.** Age 50; married, American. Has been in first-class mills and refers to them. Has worked on raw stock, wool, shoddy, and cotton, also piece dyes.

1426 **Dyer,** silk or cotton. Age 45. Married. Italian. Learned trade in France. Has worked 23 years in this country in good mill. Refers to past employers.

1427 **Second Hand Cotton Piece** Dyer. Age 38. Married. Worked on canton flannels, sateens, drills, ducks and all kinds cotton piece goods. Was 12 years in one mill as second hand. At present employed but can leave at once. Well recommended.

1327 **Skillful Dyer** with experience on raw cotton and wool, indigo blue vats, slubbing, worsted and woolen yarn, piece dyeing on ladies' dress goods and men's suitings. Age 45; married. First class references from good mills.

1415 **Dyer.** Now out of work on account of the mill being stopped. Aged 30, and married. Will start for small pay. Accustomed to Beavers, Broad and Carriage cloths, Repellents, fancy Cassimeres, Raw Wool and Cotton, light shades or piece dyes. Refers to past employers.

1346 **Chemist or Salesman.** Graduate Crefeld Textile School, colorist for German manufacturers, and since employed for 3 years in this country as colorist. Young man, single.

1292 **Woolen Dyer** with experience also in mixes, piece dyes, rags, hosiery, black cotton, waste and shoddy. Has held boss job several years. Age 34; married. Very good references.

FINISHERS.

1428 **Overseer of Napping.** Young man just out of position because his mill stopped making fleece lined underwear. Experience on French machines and Davis & Furber cloth and knit nappers. Can refer to leading Mass. mill men for whom he has worked. Will go West. Single.

1359 **Woolen Finisher** of all kinds of woolen goods; 20 years in charge, at three leading mills. At present out of employment; expects $4.00 a day. Age 45, married; references first class.

1437 **Finisher** wants to change present job for one paying $2.50 or more. Has had a wide experience for a young man. Has worked on many kinds of machines and has good references. Single. Age 30.

228 **Worsted or Woolen Finisher.** One of the best men in the country. Age 36; married. English. Has had charge of the leading mills in this country. His experience covers woolen and worsted men's wear, also ladies' dress goods, overcoatings, cloaking, etc. Understands the new German finish applicable for dress goods up to eight ounces. By stiffening on the back this finish makes single warp filling goods equal to two-ply.

KNITTERS.

1450 **Foreman or Superintendent of Hosiery.** Age 40; married. Has worked on cut feet, seamless half hose, ladies' and children's hosiery. Is familiar with every standard make of knitting and sewing machines. Is first-class finisher, and can start new plant. Salary moderate. Prefers to go South, if possible. Refers to former and present employers.

1441 **Supt. or Overseer in Hosiery Mill.** Age 49; married. Wishes to obtain a position near Boston. Cannot take a position before January 1st, 1899. Has worked on all classes of knit goods and is familiar with all the leading makes of machinery. Refers to past employers.

1405 **Boss Knitter.** Young man with good knowledge of knit goods At on circular ribbers. Thoroughly experienced on mittens, leggings and golf hose. owns 3 machines. Can bring best of references from large concerns. Desires position with good house.

1410 **Knitting Machine Fixer.** Young man who wants to gain large experience in this line desires a position in the Eastern or Central states. Is expert on many kinds of machines. Leggings, bicycle hose, gloves, mittens, etc. Highly recommended as to character and ability.

1362 **Boss Rib Knitter,** young man, now second hand in fleece lined underwear mill in New York State wants to advance. Very highly spoken of by present employers as to both ability and character. Could change on short notice.

1435 **Boss Knitter** Underwear, astrakhans, stockinet, rubber linings, etc. Efficient workman on circular spring needle machine. Age 36. Married.

DESIGNERS.

1444 **Designer.** Has made a special study of designing during the past ten years. Wants a position which offers chance for advancement. Has worked on all classes of goods and is familiar with standard makes of machinery. Can fix, set up and has started sections of new fancy looms.

1445 **Designer or Finisher,** or will take position as supt. of a small mill. German, protestant, age 36, married. Has worked in several New England mills and refers to them. Graduate of the Werden Textile school, Saxony. Has worked on kerseys, beavers, cassimeres, cheviots, etc. Is familiar with all makes of American and German machinery

1447 **Assistant Supt. or Designer.** American. A graduate of Philadelphia Textile school and has worked in Philadelphia and Massachusetts mills Wishes to obtain a position in Philadelphia or vicinity. Has worked on cotton shirtings, woolen and worsted dress goods and men's wear. Is familiar with all American makes of machinery. Can give good references

1449 **Overseer of Weaving or Designer.** Age 38; married; American. Thoroughly capable. Has designed his own goods for eight years, and studied designing for two years. Left last position on account of sickness, and will take a small salary to start. Has worked on all classes of cottons, plain and fancy, and is acquainted with all makes of machinery. Refers to former employers and others.

1259 **Color Designer** or Woolen Superintendent. Age 39. Good, steady reliable man. Refers to past employers.

MISCELLANEOUS.

1451 **Mechanic or Chief Engineer.** Age 37; married; American. A first-class mechanic and engineer. At present employed, but wishes to obtain a position where there is a better chance for advancement. Has been 2½ years in present position as master mechanic, and was previously for 13 years with one firm as department foreman, engineer and master mechanic. Refers to former and present employers.

1448 **Cashier or Bookkeeper.** Age 26; American, single. Is a college graduate and has been bookkeeper and paymaster for one firm for eight years, to whom he refers. He is competent to take any position of trust in a mill office.

1446 **Boss Machinist or Engineer.** American, 35 years old, married. 12 years in last place. Refers to former and present employers. Familiar with all repair work in cotton mill.

1363 **Twisting, Spooling, Warping** overseer. Experience on single and twisted yarns up to 2/10s in one of the best New England mills. Now employed as assistant; young man, but is confident that he could satisfactorily fill overseer position.

1399 **Master Mechanic** with experience from bench work up to foreman. Has worked in cotton mill and cotton machinery works. First-class workman. Can get the best results from power plant and machinery.

1404 **Chief Engineer and Machinist.** A man who is fitted by education and experience to take charge of a large plant. Well acquainted with all kinds of mill machinery. Has had charge of erection of steam, water and electrical plants, pumping machinery and cotton mill equipment. Would be an excellent man to superintend the erection of a new plant and economical operation of same.

1381 **Cloth Examiner.** Worsteds or woolens. German, age 50, single. Man of high character, 9 years in one of the leading N. E. mills and also in large N. Y. clothing houses. Best of references.

1395 **Overseer of Slashing, Spooling,** warping and drawing, a man who thoroughly understands his business and has excellent habits, well recommended from leading mills. Age 42; married.

1379 **Overseer, Cloth Room.** Out of work because of change in management. A man with first-class record and wide experience. Refers to several prominent mill men. Age 39; married, American.

1335 **Loom Fixer or Second Hand.** Knowles and Crompton looms, fancy worsteds and cassimeres, dress goods. German; Protestant; age 37, married. Has been employed in good mills and is very well recommended.

1436 **Boss Dresser.** At present out of work because mill is running slack. Experience covers a large line of goods on D. & F. and Cleveland machines. Would start at $3.25 a day if work was steady. Age 26 Single. A very reliable young man.

1301 **Book-keeper and Paymaster.** Young man of the very highest character desires to move away from the Atlantic coast, on account of his health. Best references from his present and former employers.

1418 **Cloth Hall.** Overseer, shipping clerk or paymaster. Has had a thorough experience in each of the above positions and is familiar with white and colored cotton goods. Is well recommended. Aged 35. Married, and is also a good all around accountant.

Eastern Yarn Market.

(Continued from page 141.)

Last year this source failed the spinners because much yarn was on hand purchased at the low rates of wool. The knitters in general are looking forward to a better business next season and will undoubtedly be the first branch of the woolen industry to establish itself on an improved basis. The underwear knitters are running fairly well at this, and are fast running out of wool. Undoubtedly these manufacturers are making money as they own much stock at anti-tariff prices, and are selling garments based on the high tariff rates. When this stock is exhausted these mills will be forced on the market to buy yarn and wool. They are in no mood to buy at present, although many are nearly cleaned out of stock. Many are willing to buy at impossible prices and are beginning to investigate the wool market. The prices of wool do not please them. Spinners of woolen yarn have orders today and are running, but could easily handle much more business. Wool dealers, while anxious to sell, are firmly maintaining prices.

The situation, as we find it today, is one of mystery. We are not importing, our mills are barely running, and then on the cheapest class of fabrics. Wool is advancing to the importing point; buyers of all classes of manufactures, both of cloth and knitted fabrics, are trying to force lower prices, and, because many manufacturers will not meet them, are staying out of the market. The day of retribution is at hand, and buyers will find that prices cannot be forced lower, and an active demand and scarcity of goods are sure to be the result of the present state of affairs. The wise man is ordering wool and yarn now. Prices are firmly maintained.

—Some say the practice of heavy sizing dates from the Crimean war, when, owing to the scarcity of tallow, china clay was used as a substitute.

Facts and Gossip.

—North Carolina, Raleigh. Business men of Raleigh and Harnet county are considering the building of a new cotton mill near this place. It is also rumored that a company will be organized to put up a small mill of about 5,000 to 7,500 spindles before the end of the year.

—Pennsylvania, Lancaster. The machinery, tools, shafting and belting of No. 1 cotton mill owned by Francis Shroder & Co., were recently sold for $25,000. The mill property was also offered for sale, but the upset price was not reached.

—Pennsylvania, Philadelphia. William Henderson, ingrain carpet manufacturer, now at Fifth and Columbia Avenues, will shortly move to his new mill on the corner of Mascher and Oxford Streets.

—*Pennsylvania, Philadelphia. W. & R. Ford, carpet yarn spinners, will soon remove from their present location at Orchard and Mills Streets, to their new building on Torresdale Ave., a description of which was given in one of our recent issues.

—Pennsylvania, Philadelphia. Rachel A. Pywell, hosiery manufacturer, 1926 Taylor St., has made an assignment for the benefit of creditors to George Bradford Carr. The deed, which is dated the 4th inst., conveys no real estate, but covers the stock, machinery and fixtures of the establishment.

—Pennsylvania, Philadelphia. M. B. Laubach, manufacturer of full fashioned and seamless cotton hosiery, formerly located at Third and Green Sts., has removed to the third floor of the Model Carpet Mills, Second St. and Alleghany Ave.

—*Pennsylvania, Troy. We are officially informed that the Northern Woolen Manufacturing Company, formerly of Coudersport, Pa., will move their plant to this place and will manufacture cloth and make it up into clothing. The capital of the company is $75,000. President, C. J. Marble; treasurer, J. Carlton Marble. The plant will consist of six looms, two sets of cards and eight sewing machines, giving employment to about sixty persons. Steam and dye.

—Rhode Island, Woonsocket. Messrs. Simones and La Poutre, of Verviers, France, are considering the question of leasing or buying the mill property of the Harris Woolen Co., for the purpose of manufacturing woolen and worsted goods. This mill has been closed for four years.

—South Carolina, Chester. The plant of the Chester Cotton Mill Co. will be sold at auction Nov. 17th. The upset price will be $60,000. This is the outcome of the case brought against the mill company by the D. A. Tompkins Co., of Charlotte, N. C. B. M. Spratt is receiver of the company.

—South Carolina, Fork Shoals. The Oak Lawn Co's mill at this place has been purchased by J. H. Latimer. Mr. Latimer held a mortgage of $12,000 on the property and bid it in at that price. The mill has about 3,200 spindles. It is understood that J. H. Latimer and James P. Latimer will operate it in the future, and probably increase its capacity.

The Best is the Cheapest.

It is BETTER and CHEAPER to wind yarn by the "Universal" system before shipment from the mill, thus insuring perfect delivery to knitting machines without rewinding.

UNIVERSAL WINDING CO.,

F. H. BISHOP, Manager.

226 Devonshire St., - Boston, Mass.

Chas. B. Cook, *Pres.* Arthur H. Mason, *Treas*
Capital Stock, $500,000.

SANFORD SPINNING CO.

Fall River, Mass.

32,000 Spindles. Weekly product, 65,000 pounds 6s to 30s.

Colored Cotton Yarn

From American Peelers and Egyptian Cottons.

Solids, Mixtures, Bleached, Combed and Carded Egyptians. Cops and Cones.

Knitting and Weaving Yarns

Cones, Cops, Warps, Skeins,
Single, Double, Three-ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.

EDWARD S. HYDE, 223 and 225 Chestnut Street, **Philadelphia, Pa.**

YARN DEPARTMENT.

Eastern Yarn Market.

Cotton Yarn:—Spinners are getting few orders. The knitting trade is changing from heavy-weight to light-weight underwear, and are not anxious to place heavy orders on a declining market. The knitters have ordered some yarn to cover immediate requirements. The so-called combination has reduced list prices one cent per pound. Speaking of the combination: It is getting to be a farce and is a positive detriment to the spinners in the organization. Here is one of its methods:—These mills in the combination sell all yarn by list price, but when a hard buyer insists on lower prices, the mills, rather than loose the business, will claim that, while they cannot sell under the list price, they will sell them a yarn and mark on the case "special," and sell from one cent to one and one-half cents under the combination price. The yarn is exactly the same and the only difference in the transaction is that the word "special" is marked on the case. The spinners of frame yarn are doing a fair amount of business with the worsted weavers running cotton worsted. The sizes used in this work range from 2/20s to 2/40s. Prices are somewhat off on account of the low price of cotton. We think one of the cheekiest transactions we ever heard of was that which befell a certain commission house we know of. This concern had been selling cotton warp for a certain Southern spinner. This spinner had written the steamship agent requesting him to follow up the delivery, and try to find out where the yarn was going and the rating of the concern the yarn was sold to and to let him (the spinner) know as soon as possible. (They enclosed a postage stamp.)

The spinners of combed Egyptian yarn are getting some orders, but are not running full time. Those spinners making the best yarn are getting the most orders. Knitters are beginning to realize the difference between a well combed yarn and a partially combed yarn. Those who, heretofore, used the better grade of yarn have the trade, as their garments have established themselves. At this time the very best goods and the very poorest are those which are selling. The yarns used for balbriggan, are 1/20s if single thread is to be run, and 1/40s if for two-threaded garments. The hosiery trade have been fairly well employed and have used much colored yarn, and also combed yarn. Spinners are much discouraged at the present outlook, and the prices are in many instances normal, with the exception of the very finest yarns in combed stock. These yarns are holding their own, other yarns are off in price. The knitters in Cohoes, Bennington, and Herkimer, are doing but little business at this writing. Fleece-lined knitters continue to get orders, and are getting orders mostly for men's wear. The prices which these garments sell at continue to range lower than last year. The West continues to contribute the bulk of the orders, and knitters will get underway to fill these Western orders about November 15th to December 1st. The Philadelphia knitters, most of them, closed the entire week of the Peace Jubilee, and business was quiet at that point.

Worsted Yarn:—Spinners are getting sample orders and occasionally a fair sized contract. Prices for yarns are nominal and very low as compared with what the wool to make the yarn would cost on today's market. Australian 2/40s fine stock is being sold for 92 cents. The wool, to make on today's market, would cost 75 to 77

(Continued on page 137.)

Frank E. Patterson, Prest. Oscar W. Wood, Treas

GERMANTOWN SPINNING COMPANY INCORPORATED GERMANTOWN JAN. 9TH 1890

Germantown Spinning Co.

COTTON CARDED

HOSIERY YARNS

In numbers from 6s to 26s.

Germantown, Philadelphia.

W. Warren Thread Works,

WESTFIELD, MASS.

HOSIERY AND SEAMING YARNS.

Also Polished Threads.

Our bleaching and dyeing facilities are new and unsurpassed for prompt and neat work. Correspondence solicited.

AMERICAN SPINNERS' COTTON YARN EXCHANGE

AMERICAN SPINNERS'

Cotton Yarn Exchange.

COMBED AND CARDED COTTON YARNS

From Northern and Southern Mills.

ARNOLD B. SANFORD, - MFRS. AGENT,

45 Milk Street,

BOSTON, - - MASS.

Eddy & Street,

COTTON, WOOLEN, **YARNS** AND **BRAIDS** WORSTED, SPUN SILK.

PROVIDENCE, R. I.

Cohannet Mills,

TAUNTON, MASS.

Spinners of High Grade

HOSIERY YARNS OF EVERY DESCRIPTION.

Selling Agents JAMES E. MITCHELL & CO., Philadelphia and Boston.

DANIEL S. PRATT,

180 Summer Street, - BOSTON,

ROOM 24.

851 Calle Piedad, Buenos Aires.

SOUTH AMERICAN WOOLS,

..Personally Selected..

Graded to the Standard of U. S. Markets.

WAVERLY WORSTED CO.

SPINNERS OF

WORSTED YARNS

FOR WEAVING AND KNITTING.

Main St. & Green Lane, Manayunk, Philadelphia.

Continued from page 135

cents; and a good, fine 2/40s Australian half Delain, cost 85½ cents. Mills are still manufacturing heavy weights, and one of the largest mills in Providence is about to start 300 looms to be run night and day. The run is to be on cotton worsted and undoubtedly heavy weights will be run also. The light weight season generally starts in July 1st, but this year the samples were not shown before Sept. 1st. The weavers of Rockville and vicinity are running fairly well, and report orders fully a month late, although buyers expect immediate delivery. Notwithstanding the fact that weavers are running, very few new orders are being placed for yarn. Many manufacturers are running their mills on yarn purchased over a year ago. The class of yarn called for, is yarn to make a medium class of fabric, about one-half blood quality. Weavers are very careful about changing the "feel" of their cloth. It has got to such a time when the weaver will not put a different yarn into his cloth, even if it be finer, for fear his customers will reject his goods because they were not exactly like the "others." There is no doubt of there being much more all-worsted cloth sold, although there are a number of mills making fine fabrics which are not doing well. We do not look for much business for yarn on heavy weights until after January 1st, as mills will not place orders for yarn until orders for cloth have been secured. The chances are that buyers will get stuck for not buying in November and December, as after the first of the year any demand for fabrics means a sharp advance on yarn. The chances are that there will be a good demand for heavy weights. Even now, there is a shortage of heavy weights, and every "cold snap" enables manufacturers to work off their surplus stock of these. There is plenty of cheap "truck" on the market, and buyers are giving this class of goods the "go-by." We know of one mill

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CATLIN & CO.,
YARNS.
67 Chauncy St., Boston
216 Church St., New York.
206 Chestnut St., Philadelphia.

ALEX'R KING & CO.
YARNS.
FINE IMPORTED YARNS A SPECIALTY.
54 Leonard St., New York.

JAMES E. MITCHELL & CO.,
Commission Merchants.
122 & 124 Chestnut St., Philadelpia, Pa.
6 & 8 Summer St., Boston.
Cotton, Woolen & Worsted Yarns.
All numbers on Hand and Made to Order.

O. S. HAWES & BRO.,
WEAVING and HOSIERY **YARNS,**
All Plies and Numbers.
Imported Yarns a Specialty.
82 and 84 BEDFORD ST., FALL RIVER, MASS.

TUCKER & COOK MFG. CO
MANUFACTURERS OF
WHITE AND COLORED COTTON **WARPS**
Nos. 6s to 30s,
On Beams, Jack Spools or in Chain
CONWAY, MASS.

GRANT YARN CO.,
COMBED AND CARDED COTTON
YARNS 40s and above. AND
FITCHBURG, MASS. **WARPS**

E. JENCKES MFG. CO.
Colored Cotton, Hosiery, Woolen and Merino **YARNS**
PAWTUCKET, R. I.

LINEN YARN IMPORTER.
Hughes Fawcett, 115 Franklin St., New York,
Flax, Hemp & Jute Line and Tow Yarns,
FOR WEAVING PURPOSES
Linen Jacquard Harness Twines.
Fine Cotton Harness and Heddle Twines.
For Cotton, Silk, Woolen and Carpet manufacturers. Correspondence solicited. Samples promptly furnished.

CAPACITY, 50,000 Spindles.

ORSWELL MILLS

FITCHBURG MASS.

COMBED OR CARDED

COTTON YARNS

In Chains and Skeins, on Balls, Beams, Spools—single or twisted.

The J. R. MONTGOMERY CO.,

WINDSOR LOCKS, CONN.

MERCERIZED EGYPTIAN COTTON SPINNING BANDS.

We claim for them

- They will not shrink nor stretch.
- Are not affected by dry or humid atmosphere.
- Are Fifty per cent. stronger than ordinary bands.
- Will last twice as long.
- Less power required to run spinning.

Mercerized Cotton Yarns which give the High Silk-Like Luster.

PLAIN AND FANCY PATTERN

Cotton Warps,

WHITE, MIXED AND COLORED.

For SATINETS, BLANKETS, ETC.

WHITTIER COTTON MILLS,

LOWELL, MASS.

INDIAN ORCHARD CO.,

Indian Orchard, Mass.

MANUFACTURERS OF

Lustred Cotton Yarns.
In Various Colors and Twists.

NOVELTY YARNS
In Cotton, Silk and Worsted, in various patterns and colors.

Cotton Warps and Yarns
In Gray and all colors, single or 2, 3, 4 and 6-ply, and Cable Cord.

COLORED COTTON
Machined, Carded or in Roving.

(Continued from page 137.)

that has been making cloth which if shaken will almost come apart, it is so loaded with shoddy. Some spinners are running out of stock, while some of the larger ones own thousands of pounds. One spinner, we know of, has over 2,000 bales Australian wool which has never left the storehouse. No one knows how much wool is owned by manufacturers. The larger ones have it to "burn," while the smaller mills are about run out. Spinners are buying tops in some instances in large quantities.

Spinners, indeed, have troubles of their own. We have received an interesting letter from a spinner which shows how things have worked the last ten months. In speaking about his experience the past summer he says:—"We might have done well all summer on ⅜ stock, but having closed down, as we have been doing off and on during the past year, we would not take the business, as we have been trying to get a living price, and if we could not get it have stopped. We may have made a mistake in doing this, as in the case of the ⅜ blooded work. This stock was worth 5 cents per pound more when we stopped than what it has been sold lately for. This, of course, is quite an item where stock is owned at the high price, and it might have been bad judgment in not running, for had we run we would have saved that 5 cents per pound, though if we had run we could not, at the time, have figured a profit; yet by careful management we might have figured a small margin, and, anyway, it would have kept the help together, giving them work, and certainly have done the machinery more good by being kept running. We are now of the opinion that many other spinners have been glad to run, and clear expenses until the time would come when they could do better. Of course we must expect failures, as it is one of the laws of economics, but there is money in the business, as the

(Continued on page 141.)

Colchester Mills,
SPINNERS OF
Made from Colchester Mills Sanitary Random Yarn
Mule Spun Cotton Hosiery Yarns.
Sales in Charge of A. D. SALKELD, 86 & 88 Franklin St., NEW YORK.
Representing B. B. Smalley, Thos. F. Patterson, F. E. Snow
Receivers Colchester Mills.

WOOLEN AND MERINO YARNS.
Special line for Bicycle and Golf Goods in all shades
For Hosiery, Gloves, Underwear, and all kinds Knit Goods. Cop, Cone and Skeins.
The J. & H. Clasgens Co.
New Richmond, O.

WOOLEN YARNS.
All grades Woolen, Mixed and Merino yarns.
15 SETS CARDS.
EDWARD M. ROCKWELL,
LEOMINSTER. - MASS.

A. HERBST. J. W. JONES.
HERBST & JONES,
Successors to Kershaw Worsted Co.
WORSTED YARN SPINNERS,
21st & Naudain Streets,
PHILADELPHIA.

ALBERT R. ELSASSER,
Clifton Worsted Mills.
Lustre Worsted Roving and Yarns
A SPECIALTY.
MILLS: ADDINGHAM, DEL. CO. PA.

C. MOORE & CO.,
MANUFACTURERS OF
TWINES, THREADS AND YARNS.
Jacquard Harness Twines of all kinds on hand and made to order.
S.W. COR. FIFTH & MARKET STS.,
Philadelphia.

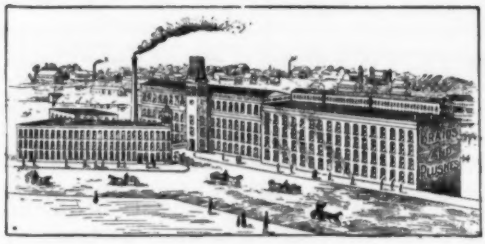
EICHMANN & STERNBERG
530 Broadway cor. Spring St., NEW YORK.
Plain and Gassed Cotton Yarns,
HOSIERY COTTON YARNS,
Mercerized Cotton Yarns. Harness Twines.

COTTON WARPS
White or Colored.
Toweling and Grain Bags.
Dana Warp Mill,
WESTBROOK, MAINE.

HADLEY
SPOOL COTTON AND FINE YARNS
COMPANY
COTTON SPINNERS.
MILLS AT HOLYOKE, MASS.

SPINNERS OF
FINE COTTON YARNS
30s TO 100s.
Gray, Bleached, or Colored. On cop, in skein on spools, cones or tubes.
Fine Cotton Warps, single and two-ply, in chain, etc.
Spool Cotton and Seaming Thread.
95 Milk St., BOSTON.

THE WILLIAM CLARK COMPANY,
WESTERLY, R. I.
Mills equipped with the latest and most improved machinery.
Combed Egyptian from No. 20s to 100s. Combed Sea Island from No. 40s to 200s.
Also 2, 3, 4, 5 ply and 6, 9 and 12 ply cable laid.
Hosiery Yarns on Cops Tubes or in Skeins, Grey, Bleached or Dyed. (Fast Colors.



FLYER SPUN
Mohair and Worsted
YARNS.
Mohair Plushes,
Worsted and Cotton Braids.
D. COFF & SONS, Pawtucket, R. I.
ESTABLISHED 1861.

MONUMENT MILLS,
Manufacturers of
White, Colored, Fancy and Double and Twist,
COTTON WARPS
HOUSATONIC, MASS.
4s to 60s.

YARNS
SOLIS : : BOSTON.
179 Devonshire Street.
ANDREW J. SOLIS, Jr. & CO.

GREENE & DANIELS MFG. CO.,
COMBED, CARDED AND GASSED
Yarns, Threads, Twines and Chain Warps,
Colored and Bleached Yarns Furnished in any manner desired by the trade.
PAWTUCKET, R.I.

A copy of the Textile World's Directory is presented to every paip-up subscriber of the Textile World, with the compliments of the publishers.

(Continued from page 139.)

future will prove." By this it will be seen that the spinners are hopeful, even if they have had hard times. The failures of the woolen manufacturers have been felt very little by the trade in general. The indebtedness of the largest failed concern was largely carried by the banks, and the smallest concern, although using large quantities of yarn, had most of its indebtedness placed with one large spinner. The Plymouth was largely oversold and was apparently making money. The failure of this concern from apparent prosperity to failure was a surprise to salesmen offering yarn. The astrachan season seems to have been a failure this year; even those using the cheapest kind of lustre yarn have been unable to make business this year. We know of one manufacturer, who built a good-sized mill with the intention of doing all his business on these goods, but up to date he has had no business whatever. One prominent manufacturer says that the tariff is all right, but that he does not understand what has got into the worsted industry. The spinners of French spun yarn are getting some orders for future delivery, but knitters are rather shy at placing orders, even where the placing of large orders have been seriously contemplated. No doubt can be expressed that the early part of the year will see orders placed in large quantities for these yarns, and at full prices. The hosiery manufacturers are using this class of yarn more than ever and more worsted hosiery is being sold than regular wool spun.

We quote: All Australian, 2/40s, $1. 2/50s $1.05, half Delaine, half Australian, 2/40s 95 cents. Half blood, 2/40s 82½ cents. Three-eighths to half blood serge yarn, 2/36s 70 to 72½ cents. Three-eighths blood, 2/20s 65 to 66 cents. Good quarter, 2/14s 59½ to 62 cents.

Woolen Yarn:—Spinners have been getting some sample orders for hosiery yarn, and as the hosiery trade is late we confidently believe that further orders will be placed. Some 2-ply yarn is being ordered and more will be required next month, as many of the buyers are at last being forced on the market. The beginning of the year should see a great improvement in this industry. The heavy weight cloth manufactured by worsted mills will require its usual quota of yarn.

(Concluded on page 133.)

Walcott & Campbell Spinning Co,
IROQUOIS MILLS.
FANCY HOSIERY YARNS
IN ALL COLORS.
New York Mills, Oneida Co., N. Y.

BURNET & CO.,
24 George Sq., Glasgow, Scotland.
All numbers and qualities of Cotton Yarns, specialties in
"Silkoline," "Ramie" and Fancies;
also bleached filling on long tubes. Turkey reds, etc. A B C Code used. Telegraphic address "Tenrub, Gla-gow"

B. F. BOYER & CO.,
Successors to GEORGE SHIMER & BOYER,
HOSIERY YARNS,
In Wool, Merino and Worsted.
GOLF YARNS,
In Wool and Worsted. Also carry a full line
BUNDLE YARNS
For the Jobbing Trade.
MILLS AND OFFICE AT
CAMDEN, - - N. J.

Philadelphia Yarn Market.

The yarn market has been weak, but fairly steady the past month. At present there is considerable pressure, however, to sell. Prices have weakened considerably the past week or two, especially on hosiery yarns, on account of the Eastern Combination making a further drop of their prices.

The stocking trade is very dull. The underwear trade is much better, and mills, especially the Southern mills, are generally well sold up.

(Continued on page 143.)

HOWLAND CROFT, SONS & CO.

LINDEN WORSTED MILLS.

Fine Worsted Yarns

OFFICE AND MILLS:
Broadway and Jefferson Avenue,
CAMDEN, NEW JERSEY.

ALLEGHENY WORSTED MILLS,

Thomas Wolstenholme, Sons & Co., MANFRS. OF

ALL NUMBERS SINGLE AND TWO-PLY,

Worsted YARNS,

Sell Direct,

on Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural & Fancy Mixes.
Office and Mills: Frankford Ave. and Westmoreland St., Phila., Pa.

CRANSTON WORSTED MILLS.

Worsted and Mohair Yarns—white or colors, in skeins, on spools, cones, or shuttle bobbins.

NOVELTY YARNS—of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making Yarns only.

CENAPPED YARNS of all kinds. Doup Yarns. Harness Yarns for Braids, etc.

BRISTOL, R. I.

George Campbell & Co.

Worsted Spinners.

Yarns, both French System and Bradford.

Knitting Yarns in all Grades and Mixes.
All Numbers to 60s.

21ST STREET AND WASHINGTON AVENUE, PHILADELPHIA.

MALCOLM MILLS CO.,

MANUFACTURERS OF

Novelty Yarns, Silk Noil Yarns, in Fast Colors AND White.

Mills, Frankford, Pa. Office, 229 CHESTNUT ST., PHILA.

(Continued from page 143.)

Two-ply Southern yarns, both warps and skein have decreased considerably in value, on account of the dulness of the upholstery and woolen trades, although a considerable volume of business is being done.

We quote:—

WARPS.

20/1	12 to 12¼
22/1	12¼ to 12½
26/1	13 to 13½
12/2	12
14/2	12 to 12½
16/2	12½ to 13
20/2	13
30/2	15 to 15½
40/2	22

SKEIN.

26/1	12½ to 13
20/1	12 to 12½
19/1	12½
4s to 10s soft	10½ to 11
12s soft	11 to 11½
12/2	11
14/2	11 to 11¼
20/2	12½ to 13
30/2	15
40/2	21 to 22
8/3	10
10s double reeled	10 to 10½
16/3 slack	11¾ to 12
16/4 medium	11¾ to 12
16/2 slack	11¾ to 12

SOUTHERN CONES.

6s to 8s, various qual.	11½ to 12
10s " "	12 to 12½
12s " "	12 to 12½
14s " "	13 to 14
16s " "	13½ to 14
20s " "	14 to 15
22s " "	14½ to 15
24s " "	15 to 16
26s " "	15½
30s " "	17½ to 18

SHUTTLE COPS.

6s to 8s	11½ to 12
12s	11½ to 12
16s	12½ to 13
26s	13 to 13½
40s	18 to 19

MIXED COLORED CONES.

6s to 8s	13½
10s	13½ to 14
12s	14 to 14½
14s	14½ to 15
16s	15½

EASTERN COPS.

10s hosiery	12½
14s "	13½
16s "	13½ to 14
20s "	15
10s shuttle	12 to 12½
14s "	12½ to 13

Eastern skein one-half cent above cops.

Eastern cones, one-half cent to one and three-fourth cents above cops.

Egyptian, four to five cents above white.

Combed yarn, four to five cents above carded.

SILK NOILS AND SILK NOIL YARNS
IN WHITE AND COLORS.
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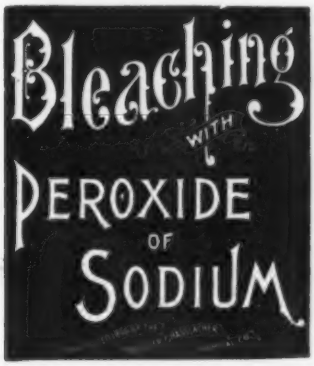

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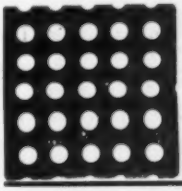

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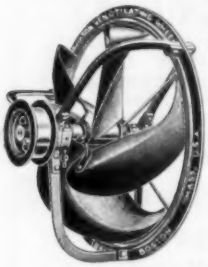

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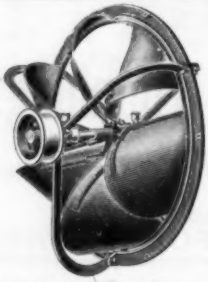

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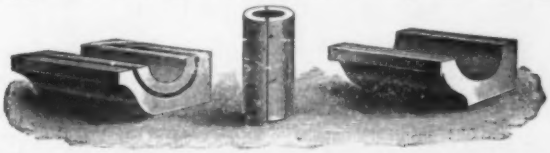

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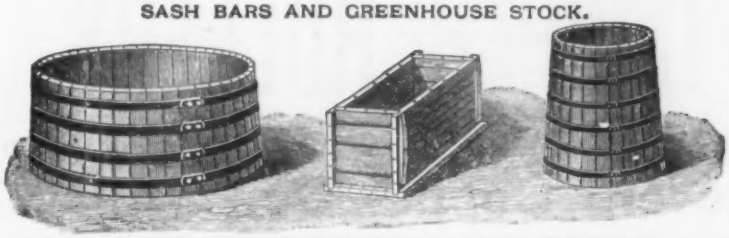

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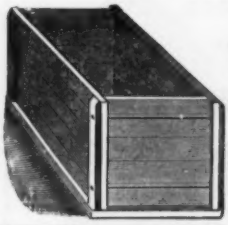

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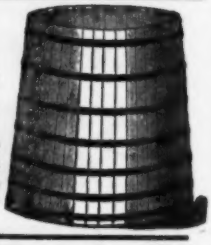

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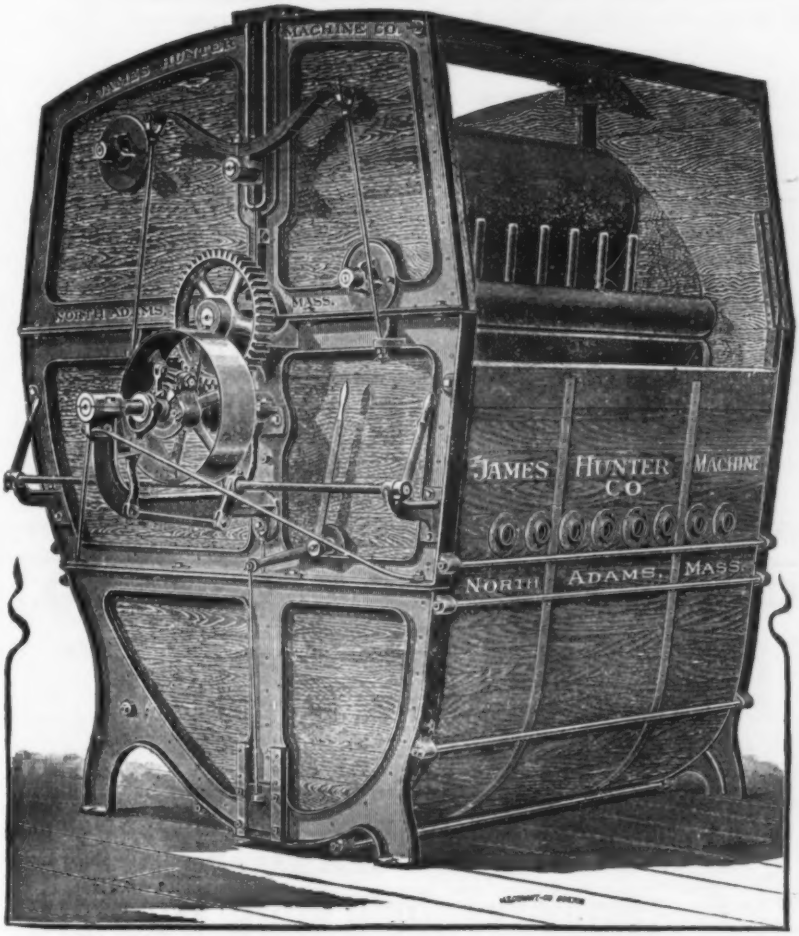

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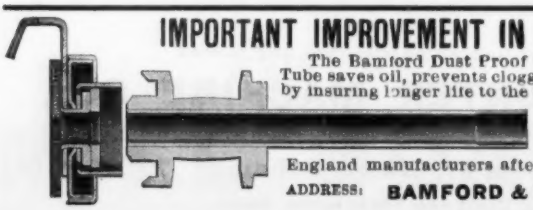

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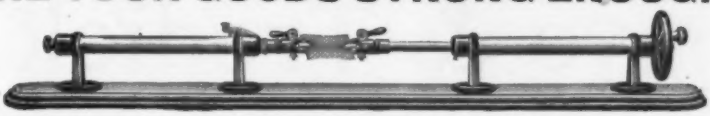

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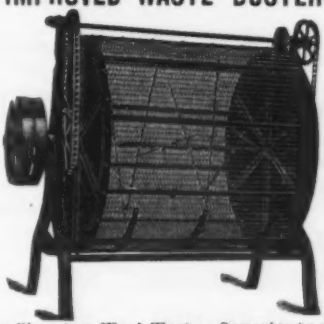

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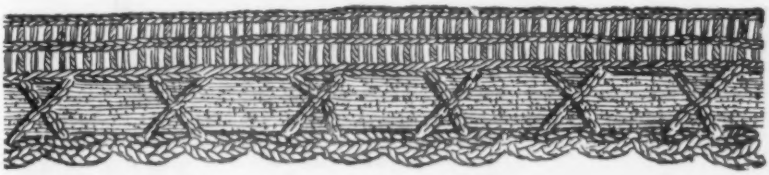

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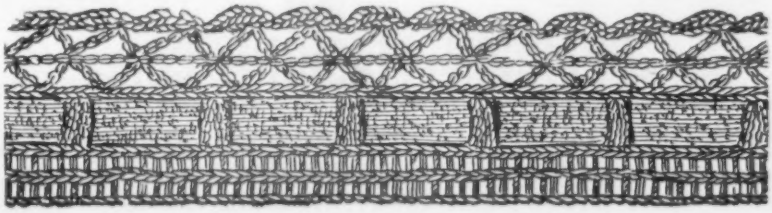

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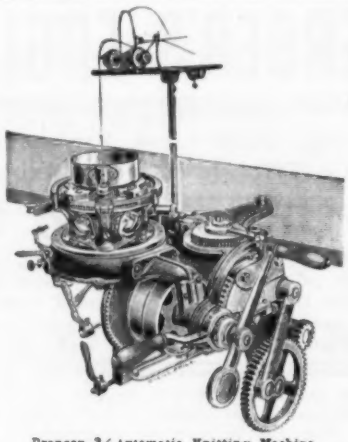

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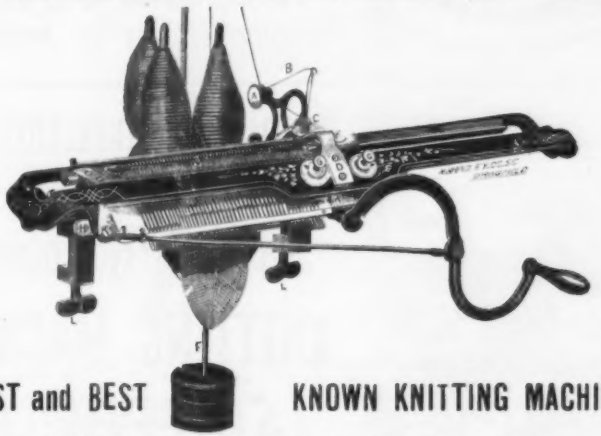

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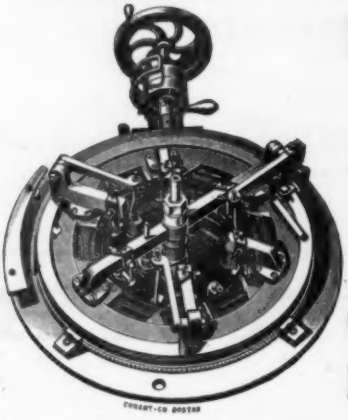

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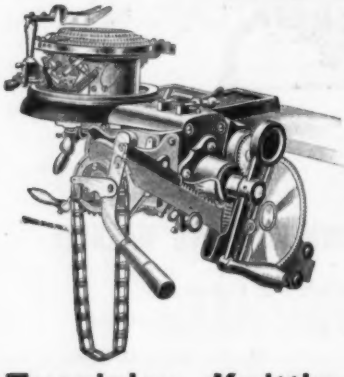

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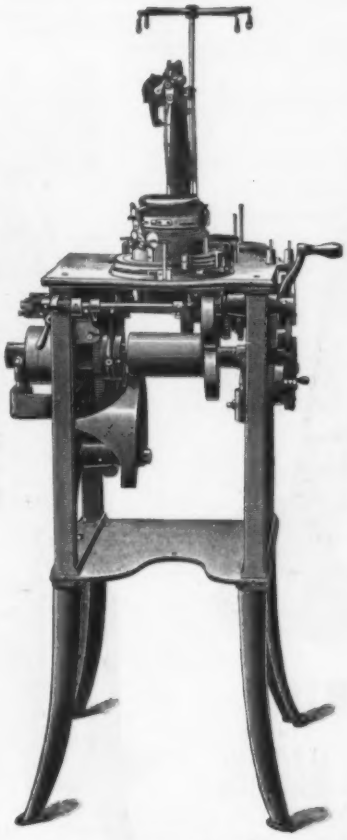

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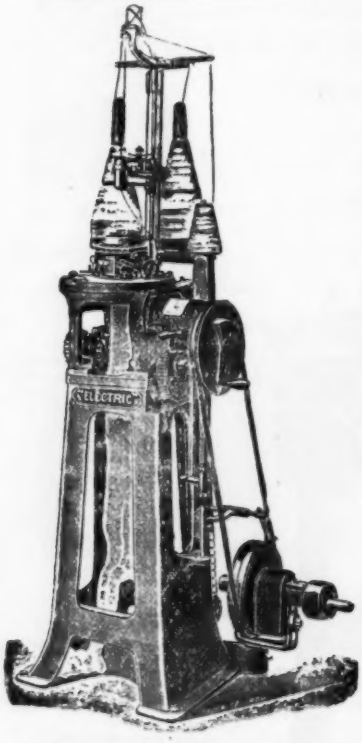

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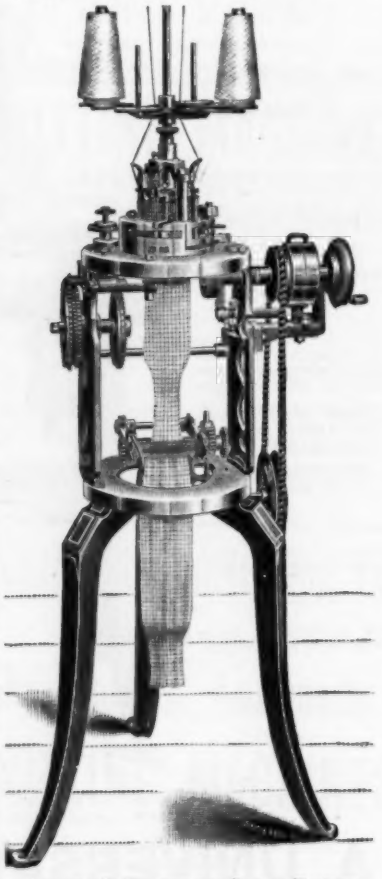

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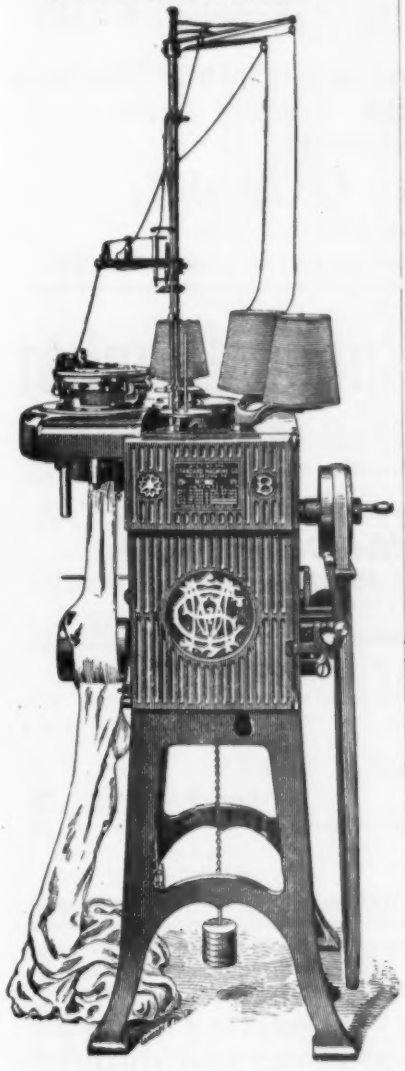

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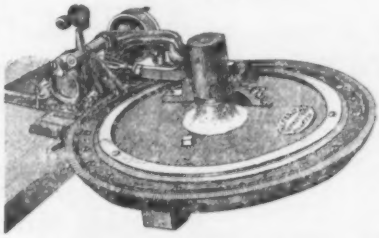

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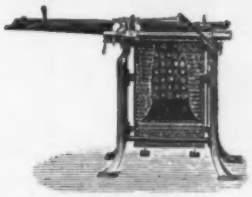

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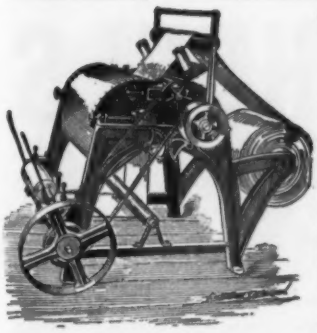

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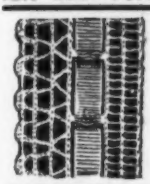

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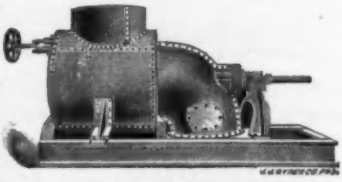

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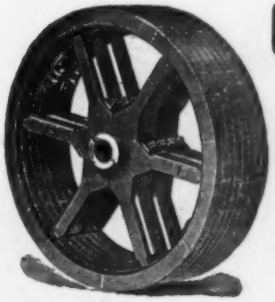

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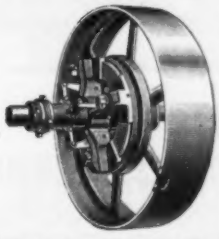

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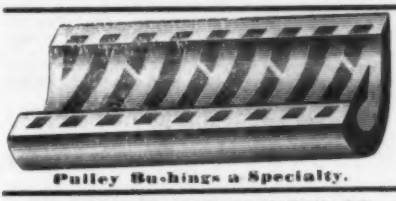

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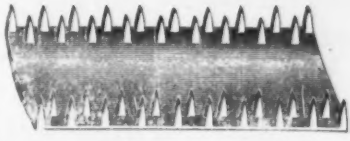

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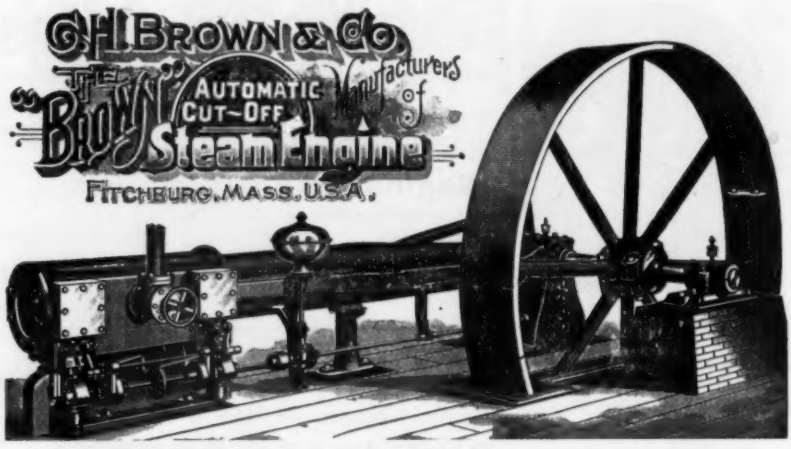

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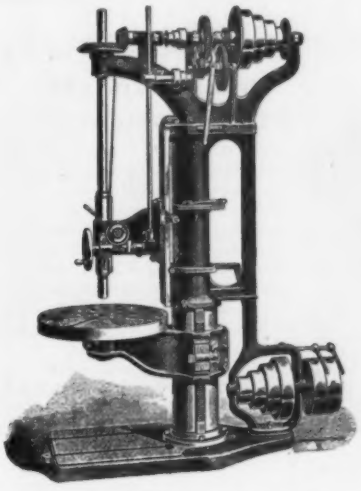

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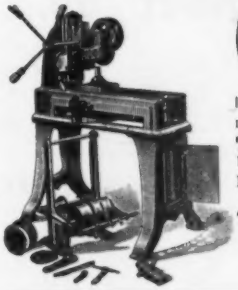

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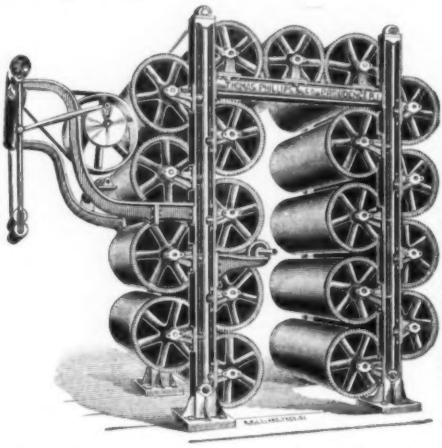

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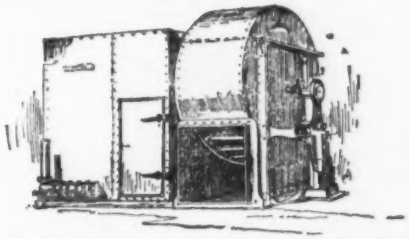

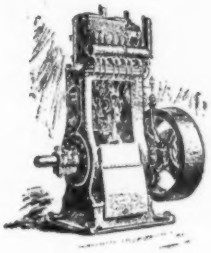

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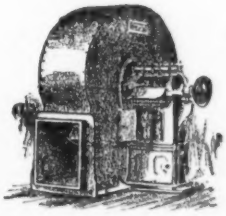

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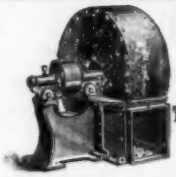

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